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USMC Voluntary Separation Incentive and Special Separation Benefit: Who's Leaving? A Focus on Quality

by

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mitted in partial fulfillment of the
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ABSTRACT

An attempt was made to determine what categories of Marines took the fiscal year 1992 (FY92) Voluntary Separation Incentive/Special Separation Benefit (VSI/SSB) programs. This thesis has the specific focus of determining whether quality Marines have been unintentionally targeted by the VSI/SSB policy. Data taken from the Headquarters Master File (HMF) and from the Performance Evaluation System, Headquarters, U.S. Marine Corps (HQMC) were used for multivariate econometric modeling and bivariate data profiling. Variables created from the data represented proxies for behavioral variables found in prior studies of job turnover and military careerist retention. Empirical evidence is presented reflecting consistencies between the two quantitative analyses. This evidence offers insight into new approaches for future research or for policy redesign.

TABLE OF CONTENTS

I. INTRODUCTION

A. BACKGROUND

The Department of Defense (DOD) is currently conducting a historically unique draw-down. It is attempting to reduce its military force roughly 25% and possibly further under the Clinton administration. Following the end of the Cold War, DOD now finds itself confronted by huge budgetary constraints imposed by a Congress determined to reduce federal deficit spending through the cutting of its largest discretionary account, DOD.

In response, DOD has begun implementing a downsizing strategy designed to reduce an all-volunteer military force, something never before accomplished by U.S. military manpower planners. From the lessons learned from corporate downsizing and from some of its own lessons learned during reductions-in-force (RIFS) in the post World War II era, both the reduction goals and the attitudes of those in the armed services were considered.

DOD was forced to deal with Congressional concerns not only over a reduced threat following the dissolution of the former Soviet Union, but also over domestic economic problems. Faced with both issues, DOD adopted several policies in its downsizing strategy. Reductions would be achieved through reductions in accessions, normal attrition, involuntary

retirement/selected-early retirement boards (SERBs), and pecuniary voluntary-separation incentives. Involuntary separations (RIFS) were considered as a last resort to be used by individual services if needed. These reductions would decrease DOD expenditures and shape the force for possible alterations in mission requirements. The Department of Defense has adopted the Voluntary Separation Incentive (VSI) and Special Separation Benefit (SSB) programs, authorized by the 1992 National Defense Authorization Act, as major policy tools in its current strategy to downsize or reduce the Department's strength [Ref. 1].

The Marine Corps has subsequently implemented these DOD incentives for the explicit purpose of downsizing through force shaping. Its desire was and is to reduce its force from 193,000 to 159,000 by 1997 through reduced accessions, normal attrition, and, of interest here, separation incentives such as the VSI/SSB program. The VSI/SSB program will be used to shape the force by reducing numbers within military occupational specialties (MOSs) characterized by promotion stagnation and by eliminating MOSs for which equipment or mission no longer exist.[1] In other words, the Marine Corps is shaping the force to anticipated requirements.

A major concern within the Marine Corps is whether it is losing a disproportionate number of quality Marines through

[1]Telephone interview with Captain Jeffery Peterson USMC, Enlisted Career Force Planning Officer, Manpower Plans Division, Headquarters, U.S. Marine Corps, Washington D.C.

these incentive programs. Another concern is, are there any important trends, i.e., any occupational groupings, duty stations, etc., that are being disproportionately represented by those taking the VSI/SSB bonuses? In other words, has the Marine Corps unknowingly targeted quality or other unintended populations?

Even though the Marine Corps initially targeted small populations with restrictive eligibility requirements, it has expanded the scope now to include a majority of occupational fields in the Marine Corps [Ref. 2]. Refinement in targeting populations for subsequent offerings of the VSI/SSB may need to be accomplished.

B. OBJECTIVES

This study has three primary objectives. The first is to determine who the Marine Corps is targeting of those eligible Marines in grades E5 to E7, through the VSI/SSB program. The major focus concerns quality Marines as defined in terms of seven quantifyable variables. Secondly, the study seeks to determine which factors best explain a Marine's decision to take the VSI/SSB. Finally, using a readily accessible, pre-existing data set, the study will identify statistically significant, theoretically-feasible results, if any exist. These three objectives will be the theme throughout this thesis.

C. RESEARCH QUESTIONS

The three objectives may be formulated as one major research question with four subsidiary questions.

The primary research question which becomes the focus of this thesis and appears vitally important to Marine Corps manpower planners is this: Are a disproportionate number of quality Marines taking the VSI/SSB voluntary separation bonuses? The four subsidiary questions are: (1) What are some "quality variables" to proxy the quality characteristics of enlisted careerist Marines? (2) What "control variables" should be used to best account for other factors affecting a Marine's decision to take/not take a VSI/SSB bonus? (3) What may be the effect of the quality variables on the probability that a careerist Marine will take a VSI/SSB bonus? (4) Of those Marines taking VSI/SSB, do trends appear in their attribute (variable) profile and, if so, what are those trends and their effect on the probability a Marine takes a VSI/SSB bonus?

The answers to these questions can be found in Chapters III, V, and VI.

D. SCOPE OF THESIS

Essentially this thesis will attempt to confirm or deny whether the Marine Corps is losing a disproportionate amount of its quality career enlisted force through the VSI/SSB programs. The author will use data from Headquarters, Marine Corps (HQMC), of those Sergeants (E5) through Gunnery

Sergeants (E7) who were eligible for VSI/SSB in fiscal year (FY) 1992. An attempt will be made to explore a number of focus variables or attributes that may best proxy quality characteristics of careerist Marines. These variables coupled with several control variables/attributes will be included in a multivariate analysis that will aid in the determination of the effect these quality and control variables may have on whether a Marine takes either of the two existing voluntary-separation incentive-bonus programs. A bivariate analysis of those taking the bonus will also be conducted using the population of FY92 eligibles.

It is not the purpose to develop a forecasting model to determine who will take this program, but to explain who has taken the program, over the FY92 Phase I-III offerings.[2] The focus is on quality Marines with a secondary emphasis on statistically significant control variables which may identify other unintended groupings of Marines, inadvertently targeted by the VSI/SSB voluntary separation policy.

E. METHODOLOGY

The methodology used was derived from prior research in both organizational behavior theory of job turnover and from studies of military retention. This prior research combined with corporate downsizing research is reviewed in Chapter II. The theory discussed in Chapter II provides a theoretical

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[2]Phase I-III were three separate VSI/SSB offerings made during FY92.

basis for the selection of appropriate proxy variables to be drawn from an administrative, pre-existing data set furnished by Manpower Plans Division (MP), HQMC. This file, taken from the Headquarters Master File (HMF), contains a list of 60 socioeconomic, demographic, and military background variables. It contains a total of 9,772 observations.[3] The population comprises sergeant (E5) through gunnery sergeant (E7) and includes only those individuals meeting the Marine Corps VSI/SSB eligibility criteria for Phase I-III.

A binomial logit regression model was specified using as the dependent variable "Take or Not Take the VSI/SSB Bonus." Again, theory from Chapter II was used in specifying the "quality variables." The model was used to determine the level of significance and the level or magnitude of effect that each quality variable and each control variable had on the probability that a careerist Marine would take a VSI/SSB bonus. To correct for potential selectivity bias of including only those observations having a specific rich performance/quality variable, the Heckman procedure was used in conjunction with the binomial logit regression model.

Equally important was the use of bivariate cross-tabulation tables that profiled the attributes of those Marines who took the VSI/SSB in FY92. Take rates were obtained for different categories of Marines. The combination

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[3]Only 9,118 observations were used for quantitative analyses due to missing values for some variables.

of both these analytical procedures, produced readily interpretable results and conclusions.

F. SUMMARY OF FINDINGS

It was discovered that quality defined by an aggregate of several proxy variables did not distinguish Marines who took the VSI/SSB and Marines who did not take the VSI/SSB in FY92. Some quality variables made distinctions, others did not, and yet others were inconsistent. If one is interested in a certain aspect of quality, then this study offers some conclusiveness. A total of 12 control variables were statistically significant in the main logit regression model. In a majority of cases, the bivariate profile supported the model's results. It was discovered that the greater the job tenure the lower the probability of taking VSI/SSB. Specifically, it was determined that E5s have been targeted by this voluntary separation-incentive policy.

A Marine's duty/job also appeared to be a significant factor affecting VSI/SSB-choice behavior. Marines on independent duty tended to take while Marines in school or assigned at school commands tended not to take VSI/SSB.

Technical occupational fields, as expected, also appear to be targeted. Technical combat service support, electronics, and aviation-oriented military occupational specialties (MOSs) tended to take at higher rates and were predicted to do so based on the logit regression model.

Finally, women tend to take VSI/SSB more often than men while blacks tended not to take at higher rates than non-blacks. Other variables showing statistical significance offered additional insight but had a weak magnitude of effect on the probability of taking.

It was discovered that pre-existing and available data sets such as the HMF yielded excellent results and are a source of future usefulness in studying turnover behavior, especially in this current environment of downsizing.

C. ORGANIZATION OF THE STUDY

Each chapter builds on the preceding chapter, i.e., Chapter II provides the theoretical framework for variable creation and model specification outlined in Chapter III. Chapter IV is confined to strictly describing the data set. It does not describe results. Results, analyses, interpretations, and some explanations are included in Chapter V. Included in the final chapter, Chapter VI, are not only conclusions and recommendations, but also an identification of research weaknesses. Remembering each research question will assist the reader in understanding, aid in following the flow, and enhance the readability of this thesis. Some research questions will be answered explicitly in Chapters V and VI while others will be answered tacitly in Chapter III.[4]

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[4]The questions referred to are those dealing with: Which variables best proxy quality and which best control for other factors?

II. REVIEW OF LITERATURE

A. INTRODUCTION

Literature directly associated with monetary incentive programs to induce voluntary job turnover in the Armed Forces does not exist. After all, this is the first large scale downsizing of the all volunteer force (AVF). To capture accepted research methodology and established theory, it was necessary to investigate three areas which seemed appropriate to the focus of this study. This literature review will explore these three areas: organizational theory of voluntary job turnover, U.S. military retention studies, and issues of organizational downsizing. It is key here not to lose sight of the focus of this thesis, which is to attempt to understand how individual performance and quality variables interact and affect job turnover.

An overabundance of research exists on various organizational theories of job turnover. Similarly, retention studies are as plentiful. This literature review will attempt to distill some of the more pertinent literature in these two areas. Downsizing literature, however, is less plentiful and lacks indepth quantitative analyses. Some of the literature does, however, include limited bivariate analyses.

Performance and quality of employees/workers/military members have seemingly been absent from the existing research.

Common problems within this area of research are definitions and measures of performance and consequently quality. In fact, the term quality is rarely found. The greatest amount of research dealing with performance and turnover is found in some of the organizational theories which will be discussed first.

B. ORGANIZATIONAL THEORIES OF JOB TURNOVER

Here exist volumes of literature ranging from multivariate analyses of the determinants of job turnover to the ordering of these variables through path analysis to the mere reformulation of existing models through non-empirical techniques. The preponderance of voluntary job turnover theory deals with variables of job satisfaction, organizational commitment, traditional demographic characteristics, opportunity alternatives, tenure, cognitive/affective orientation to job, and perceived job security. These variables are measured many ways and analyzed through many statistical techniques to determine how they affect the intention to search for a job, the intention to quit/stay, or actual quit/stay behavior.

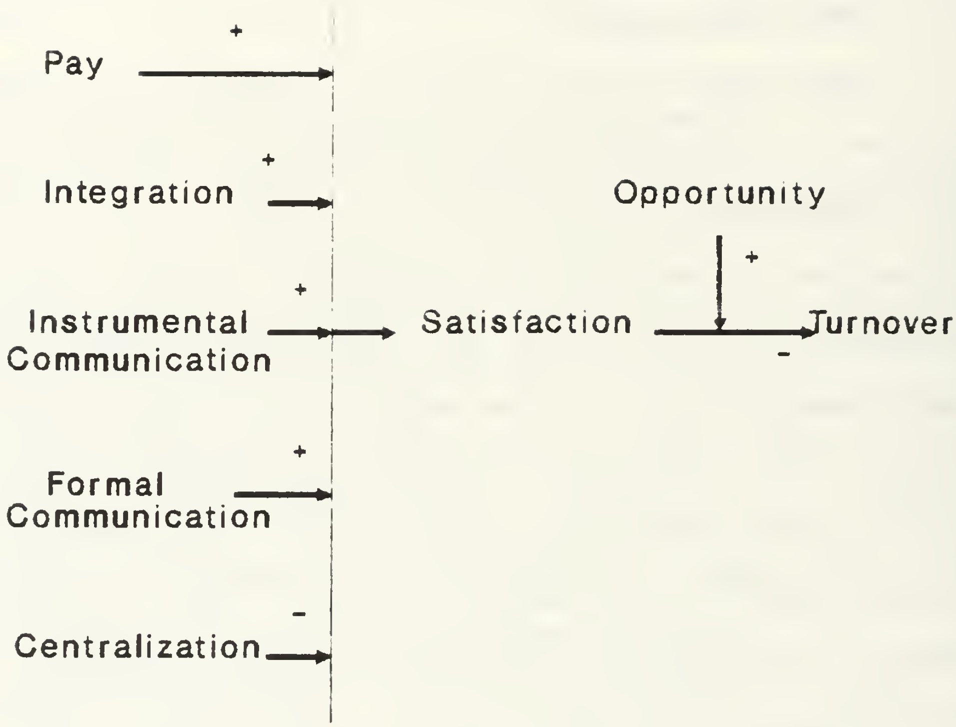
In this section the focus will be to offer some well established models of voluntary job turnover and discuss follow-up studies which have expanded, tested, or explored these models. By doing this, a better understanding of existing theory will result and the basis for this study's model and variable specification will be clearer.

The four models which will be discussed are the Price (1977) model of employee turnover [Ref. 3], the Mobley (1977) model of employee satisfaction/dissatisfaction [Ref. 4], the Bluedorn (1982) unified model [Ref. 5], and the Jackofsky (1984) turnover model [Ref. 6].

1. The Price Model

The Price (1977) model is composed of antecedent variables, a set of explanatory variables leading to a more major explanatory variable. In this case variables of employee pay, integration of the worker into the organization, instrumental communication or performance-related feedback, formal communication by the employer, and centralization of authority will determine the level of employee satisfaction which in turn affects employee turnover. One additional facet to this theory is the mediating effect that the opportunity structure has on job satisfaction's effect on turnover (Figure 1). The opportunity structure is defined as the status of the economy or outside economic conditions, i.e., labor market. Price (1977) also postulated that individual demographic characteristics (age, gender, marital status, length of service, and education) should not have independent effects on turnover once the other variables in the model were taken into account. [Ref. 3]

Numerous studies have attempted to test Price's (1977) model empirically. Price and Bluedorn (1979) used a sample of nurses [Ref. 7], Bluedorn (1979) a sample of U.S. Army



Source: Ref. 3

Figure 1. The Price (1977) Model

officers [Ref. 8], Martin (1979) used white collar administrative - clerical - professional workers [Ref. 9], Dickson (1977) [Ref. 10] and Price and Mueller (1979) [Ref. 11] all used more samples of nurses. All five studies basically confirmed the model but discovered that the mediating effect of opportunity structure on job satisfaction didn't exist; instead, opportunity structure should have been specified as one of the antecedent variables of turnover. The second common discovery was that the demographic variables did have significant effects on job turnover [Ref. 5].

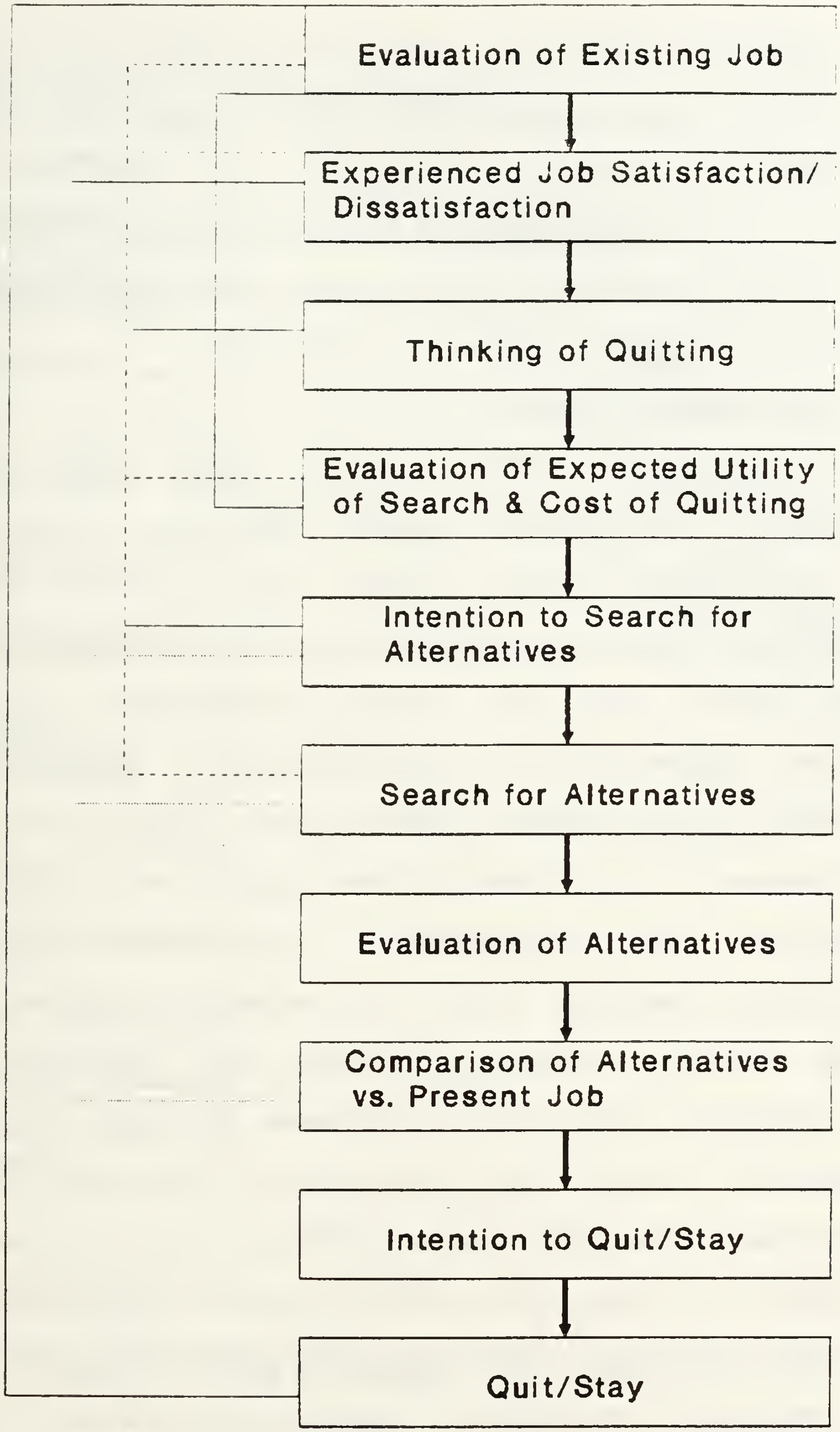
Demographic data are some of the most common and easiest types of data to obtain in research, and have proven to continually possess powerful explanatory effect in behavioral science. Countless studies within the social and behavioral sciences use demographic data. Arnold and Feldman (1982) found age as a very significant variable in determining intention to search for job alternatives [Ref. 12:p. 359]. Ighria and Greenhaus (1992) discovered age had significant positive effects on job satisfaction, career satisfaction, and organizational commitment while education had significant negative effects on job and career satisfaction and positive, direct effects on turnover intentions [Ref. 13:p. 43].

2. The Mobley Model

The Mobley (1977) model, one of the most widely known, possesses a very detailed number of linkages or mediating steps between job satisfaction/dissatisfaction and turnover.

Mobley (1977) postulated that job dissatisfaction would stimulate thoughts of quitting which in turn would lead to an evaluation of the utility to search for alternative work, which would lead to actual search behavior, leading to evaluation of work alternatives, leading to intention to quit, and finally to the actual behavior of quitting (Figure 2). [Ref. 4] What is implied in this model is conditional causality rather than direct causality [Ref. 14:p. 509].

Mobley et al. (1978) tested his model by using 203 full time employees of a southeastern urban hospital. He found significant regression coefficients consistent with paths specified by his model. These results were interpreted as support for the model's validity. [Ref. 15] Miller, Katenberg, and Hulin (1979) discovered three limitations of Mobley's et al. (1978) study. First, the low base rate of turnover of 10%, restricted variance in the criterion and affected the magnitude of relations with the predictors. Secondly, Mobley et al. (1978) relied on his regression coefficients to evaluate model validity. Considerable collinearity existed among the predictors causing skewed results. The magnitude and direction of these variables become somewhat in question under these circumstances. Finally, some inconsistencies occurred between the degree of relationship between variables. One example is age and tenure which appeared to have direct relationships with intention to



Source: Ref. 4

Figure 2. The Mobley (1977) Model

search and quit behavior, rather than having an indirect relationship as specified by the model. [Ref. 14:p. 510]

Generally speaking, Mobley's (1977) model has been supported. Hom (1984) replicated the entire Mobley model and found it only accounted for 15% of the variation in turnover behavior of a sample of nurses. [Ref. 16]

3. The Bluedorn Model

The Bluedorn (1982) unified model comes from a combination of theoretical notions from the Price (1977) model, the Mobley (1977) model, and studies of the relationship between organizational commitment and turnover. In this model there are several antecedent variables (promotion opportunities, centralization, formalization, instrumental communication, equity, pay, routinization, and member integration) or organizational factors which influence an employee's job satisfaction. In addition to these organizational factors, there are personal factors (role conflict, length of service or tenure, age, education, and marital status) which also influence an employee's job satisfaction. This job satisfaction in turn affects organizational commitment which affects intent to leave or stay (Figure 3). Bluedorn's (1982) empirical data supported these causal linkages. His findings suggest that organizational commitment intervenes in the turnover process. [Ref. 5]

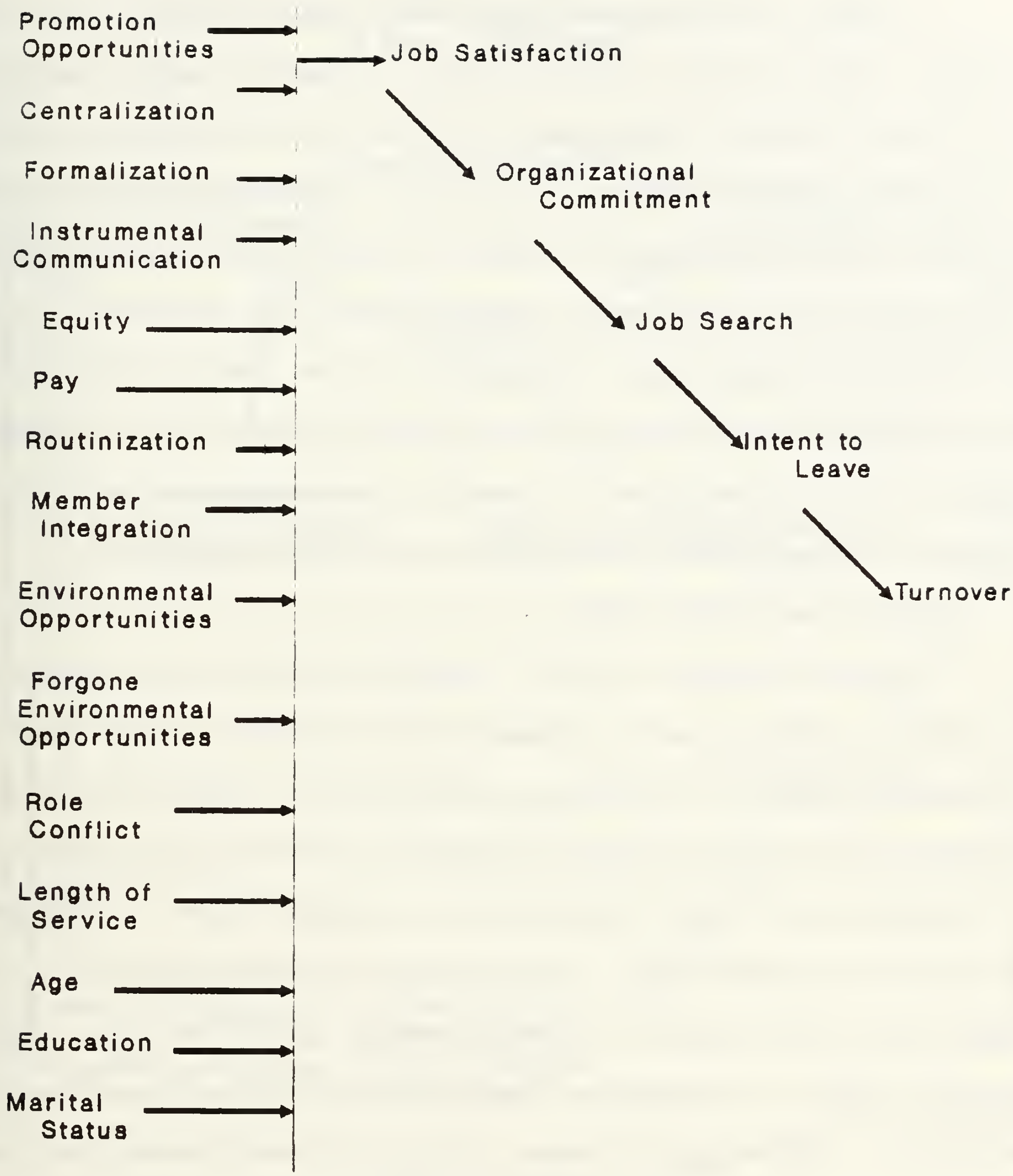


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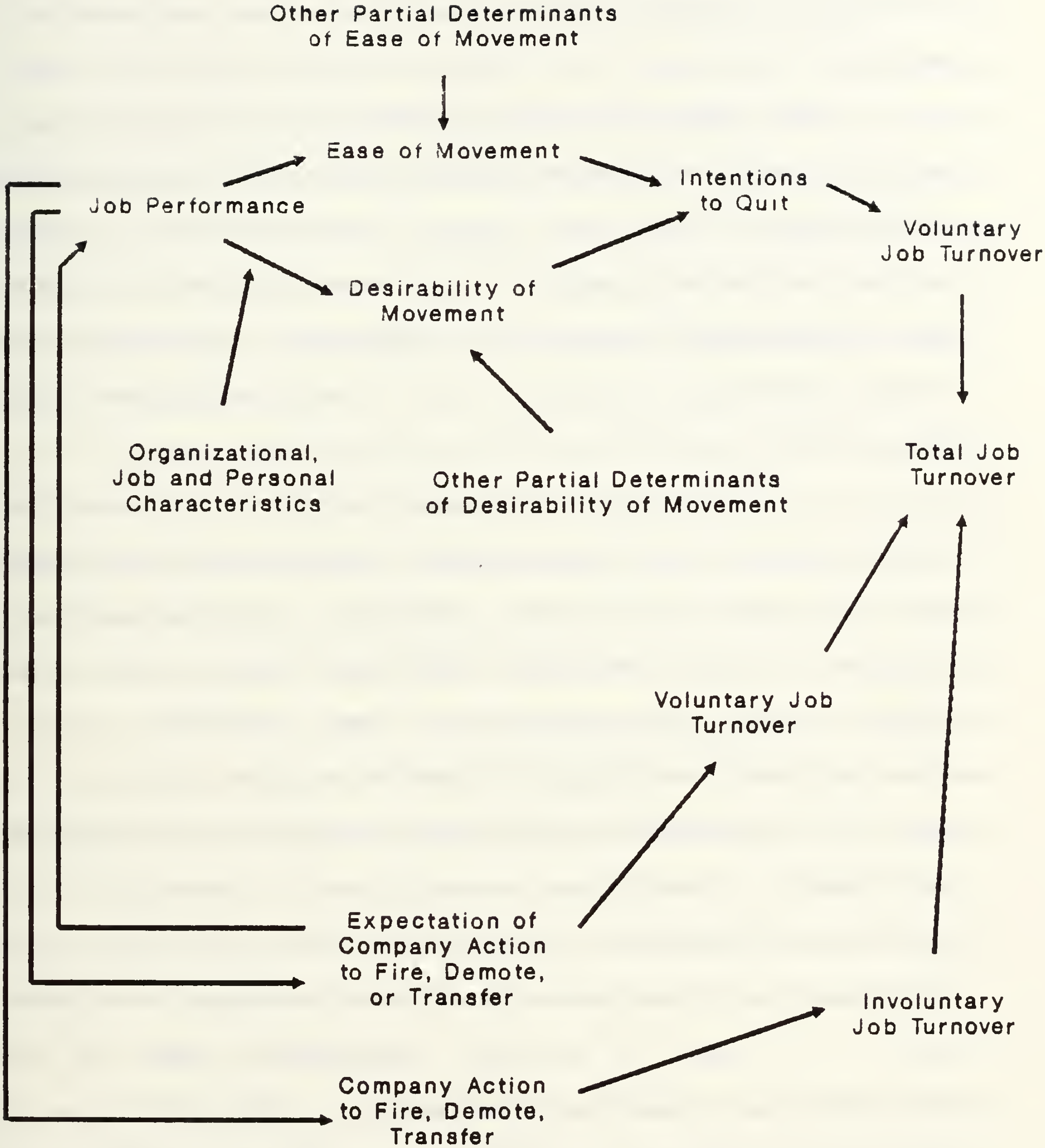
Figure 3. The Bluedorn (1982) Unified Model

Other studies dealing with determinants of job turnover have found strong direct linkages among several variables and job turnover. Arnold and Feldman (1982) discovered actual turnover behavior was significantly and directly affected by age, tenure, overall job satisfaction, organizational commitment, perceived job security, and intention to search for alternative jobs [Ref. 12:p. 359]. These differences in paths, antecedent variables, and linkages appear to be a function of research techniques, statistical modeling, measurement techniques, and data collection.

4. The Jackofsky Model

The Jackofsky (1984) turnover model is of special interest in this thesis because of the nature of its theory. This model focuses on employee performance. Jackofsky (1984) proposed that job performance impacts on both the desirability of movement out of an organization and the ease of movement out of an organization. Desirability of movement out of an organization can also be defined as job satisfaction. [Ref. 6] The effect performance has on this job satisfaction is contingent upon job-related stimuli (performance-related rewards, task structure, and leader behavior) and individual differences (self-esteem and ability). In other words if employees receive strong rewards for high levels of performance, then high-performing employees will be more satisfied with their job and less likely to leave (Figure 4). It is unclear what the effect of individual differences have



Source: Ref. 6

Figure 4. The Jackofsky (1984) Model

on the relationship between performance and desirability of movement. [Ref. 6]

The manner in which performance is hypothesized to influence ease of movement is demonstrated by high performers who perceive, within the context of current labor conditions and tenure levels, greater ease of movement inside and out of the organization in terms of expectation of finding alternative employment inside or out of the organization. [Ref. 17:p. 310]

Jackofsky (1984) model has yet to be empirically tested although some studies have touched on job performance as a variable linked either directly or indirectly to job turnover. Meyer, Paunonen, Gellatly, Goffin, and Jackson (1989) linked job performance to two different types of organizational commitment through regression analysis. They found job performance and affective commitment (strength of an individual's identification with and involvement in a particular organization) had a positive relationship while performance and continuance commitment (tendency to engage in con... lines of activity because of cost of doing otherwise) had a negative relationship. They did not test the relationship between performance and job satisfaction as discussed in Jackofsky's (1984) model. [Ref. 18:p. 155]

Shore and Martin (1989) found, through a series of regression analyses, that job performance and job satisfaction were more closely and positively related, than job

satisfaction and organizational commitment. They found specific job attitudes were more closely connected to outcomes such as performance ratings while more global organizational attitudes were more closely tied to outcomes such as intent to leave an organization. [Ref. 19:p. 625] This supports Mowday's (1979) contention that job satisfaction is more transitory and changeable an attitude than organizational commitment [Ref. 20].

Once again we find conflicting research. A careful review of both of the above studies reveal vastly different measures of performance, job satisfaction, and organizational commitment. Meyer, Paunonen, Gellatly, Goffin, and Jackson (1989) used survey data taken from samples of Canadian food service employees [Ref. 18:p. 153] while Shore and Martin (1989) used totally different survey data taken from samples of hospital and bank employees from the midwestern U.S. [Ref. 19:pp. 628-629] Nevertheless, the Jackofsky (1984) theory appears to have some relevance to future studies which deal with quality/performance measures linked to job turnover.

5. Related Research

These four models embody much of the basic theory behind voluntary job turnover within the field of organizational psychology. Numerous other models and theory exist but each tend to have roots derived from the four models above. Arnold and Feldman (1982) proposed that age, job satisfaction, and organizational commitment directly affect intention to

search for alternative employment which in turn affects turnover behavior. Both tenure and perceived job security directly affect turnover behavior. [Ref. 12] Again we have a new twist on a similar theme. Human behavior has displayed its illusiveness. The many attributes of human behavior possess delicate interaction highly sensitive to each other. Their measure is difficult to capture, as evidenced by the volumes of contradictory research in voluntary turnover behavior. It must be noted the preponderance of the research in this area comes from survey data not archival data as used in this study. Only the use of proxy variables, representing many of the variables already discussed, will be available for this study.

C. U.S. MILITARY RETENTION STUDIES

Military retention is as common a topic in the military as turnover behavior is in psychology. When looking for background information and prior research that would closely parallel job exit incentive programs, retention incentive programs seem a logical choice. In essence, exit incentives are selective reenlistment bonus (SRB) incentives in reverse. Care must be taken when interpreting studies analyzing SRBs and comparing them to VSI/SSB programs. Most retention and SRB studies deal with first-term reenlistment. VSI/SSB programs deal with careerists who have much different tastes, preferences, and demographic characteristics than first termers. The additional value that the review of retention

studies offers to this thesis is the contribution of modeling techniques and variable specification.

In this section the focus will be upon literature which deal with quality and performance measures and the effects different variables have had on retention as supported by empirical study.

1. Quality/Performance Variables and Measures

As discovered in reviewing organizational theory on job turnover, the concept of quality work force and performance was rarely addressed. Performance in organizational theory was discussed in terms of having supervisors conduct special performance appraisals on workers. This was accomplished in conjunction with those same workers who were returning questionnaires to researchers, Shore and Martin (1989) [Ref. 19] and Meyer, Paunonen, Gellatly, Goffin, and Jackson (1989) [Ref. 18]. Many retention studies have defined quality as an individual service member who has a high Armed Forces Qualifying Test (AFQT) score (mental group category) and a higher level of education, as in the Marcus (1984) [Ref. 21] and Ward and Tan (1985) [Ref. 22] studies. The Ward and Tan (1985) study did however, develop a quality index of first termers using AFQT, education level, and promotion times. They experienced a lack of good performance data. Their source of data was the Defense Manpower Data Center (DMDC) which holds no actual performance data per se. Working under this constraint, Ward and Tan (1985) found that high-quality

people in technical specialties reenlisted at a lower rate, except in the Marine Corps where the reenlistment rate was about the same. Overall they found the services were retaining more high-quality people than were leaving. This situation existed despite their evidence that when performance was controlled for, those people with high AFQT scores and higher education levels possessed a higher probability of leaving. [Ref. 22]

Marcus (1984) also used first termers and assessed the effect quality variables (education and mental group) had on retention. He found that the high quality people were much more susceptible to reenlistment bonuses and pay increases than lower quality people. He used a logit regression model to assess the effects certain variables had on the probability a service member would reenlist or not. Marcus also found as military pay lagged behind civilian pay the quality people tended to leave at a higher proportion. As was discovered in job turnover theory, Marcus (1984) linked advancement or promotion opportunities to retention. [Ref. 21]

2. Effects of Various Variables on Retention

Cavin (1988) conducted a study to determine the number of dimensions in which satisfaction with military life should be measured. Based upon a Marine Corps sample of the 1985 DOD Member Survey and using factor analysis, he discovered that an overall satisfaction variable did not exist. Instead, three factors emerged: personal fulfillment, military family

stability, and military fringe benefits. Each of these factors had an extensive composition of satisfaction variables. Cavin (1988) concluded that economic factors explain only a small part of the retention picture and felt the behavior he attempted to quantify, such as family stability, share a major piece of the retention equation. [Ref. 23]

Fletcher and Giesler (1981) conducted another study based on job satisfaction variables which combined a trinomial logit regression model with factor analysis. Here they used Navy Occupational Task Analysis Program (NOTAP) survey data and specified a trinomial dependent variable (leave, extend, or reenlist) as functions of demographic variables, military job, military life, and pay factors with service controls. They looked at careerists and found the following relationships: 1) The greater the service member's ability to choose their duty station the greater the tendency to reenlist. 2) Pay dissatisfaction tended to lower reenlistment. 3) The more dependents the greater the tendency to reenlist. 4) Non-white service members had a greater tendency to reenlist than white service members. Fletcher and Giesler (1981) concluded that quality-of-life issues impact on a careerist's decision to reenlist more than a first termer's decision. [Ref. 24]

Using somewhat of a different approach, Jacobson and Thomason (1983) took survey data from the March 1976 Current

Population Survey conducted by the U.S. Census Bureau and data from the Summary Earnings Records from the Social Security Administration to determine the effect on permanent change of station (PCS) moves on military wives' earnings and husbands' retention. Using regression analysis and a series of earnings, demographic, and relocation variables, they had difficulty in determining, directly, the effect of wives' earnings losses due to PCS moves on husbands' retention. Data inadequacy caused the problem. Regardless, the authors could conclude labor participation rates for military wives in 1975 were 8%-20% lower than civilian wives and that PCS moves lowered the collective income of many military families. [Ref. 25] They postulated, based upon Goldberg and Warner's (1982) estimate [Ref. 26] that a one percent decrease in military compensation in the form of reduced bonuses, would reduce first term enlistments by about two percent, that retention would be negatively affected by reduction of overall family income. This fact, coupled with relocation of children into new schools and incomplete compensation of PCS costs to families, creates a potentially formidable variable. [Ref. 25]

Cymrot (1987) attempted to establish a quantitative variable which would capture these various explicit and implicit costs of leaving the service. The Annualized Cost of Leaving (ACOL) approach creates a quantitative variable representing an individual's tastes and preferences which

Cymrot (1987) included into a logit regression equation having a binomial dependent variable, reenlist or leave. The ACOL approach is a purely econometric approach to much of the behavior already discussed in organizational theory of turnover. Here Cymrot (1987) uses his model to determine the effect of SRBs on retention. This effect could then be used in assigning multiples for the SRB program by occupational specialty. Cymrot (1987) did discover that as the service offers greater bonuses, the probability of an individual reenlisting does go up, unlike results obtained from purely a bivariate approach. [Ref. 27]

Retention studies have offered a number of multivariate, bivariate, and econometric methodologies for studying the effects of demographic, behavioral, and economic variables on military retention. The <u>total</u> mystery of why an individual reenlists has now been reduced to <u>merely</u> a mystery. At least through studies such as these a better idea of the type of variables and statistical methodologies used by current researchers can be obtained. This knowledge is useful when trying to construct and specify variables within a model using archival data rather than survey data. Even though quality variables were discussed somewhat, little has been done on measuring the quality of our careerist force and the impact this has on retention or turnover behavior.

D. ORGANIZATIONAL DOWNSIZING

A review of literature would seem incomplete if a brief discussion of downsizing issues were deleted from a thesis focused on a particular problem/issue generated under downsizing conditions. What is found when seeking this type of literature is a myriad of non-empirical articles focusing primarily upon the types of strategies available to downsizing organizations and the effect those strategies have on the organization in terms of efficiency, productivity, and employee morale. The few empirical studies which exist are strictly bivariate using several cross-tabulation tables and descriptive statistics. It is quite difficult to find any current downsizing literature that empirically studies the measured effects of downsizing strategies on higher performers or the quality work force within an organization.

Nevertheless, two topics exist within downsizing literature which are germane to this thesis. This section will first review literature on voluntary early retirement. Then it will explore material which conveys general concerns about the environment created by downsizing and how that environment may influence job turnover behavior.

1. Early Retirement

Strategies of downsizing discussed most in literature are voluntary early retirement incentive programs. Even though VSI/SSB is not a retirement program, it nevertheless shares some similarities, such as the cash or monetary

incentive to leave an organization earlier than planned. In the corporate world, the VSI/SSB program would equate to "buy-outs." [Ref. 28:pp. 195-196] Very little has been written about buy-outs simply because they are not the strategy of choice in the private sector [Ref. 29:pp. 35-36]. Quality people are not targeted for downsizing because corporations choose selected layoffs and performance based reductions in force (RIFs) first. Early retirement programs seem to "clean up" the balance of reduction goals. What effects do early retirement programs and buy-outs have on the attitudes of workers? A survey of middle managers from 600 companies in the U.S. conducted by Lou Harris and Associates found that 65% of managers thought less loyalty was displayed by their salaried workers than existed 10 years ago [Ref. 30:p. 29]. Kuzmits and Sussman (1988) concluded that this is a result of the new corporate environment where bottom-line results overrule job security [Ref. 30:p. 29]. In the same survey by Lou Harris and Associates, 44% of these middle managers felt sure they would be allowed to stay with the company as long as they did well. Another 44% said they may not be able to stay while the final 12% was not sure. [Ref. 30:p. 29] With this kind of environment of uncertainty, worker behavior may take on new dimensions with regard to voluntary job turnover. These new dimensions have yet to be studied.

Early retirements are a popular downsizing strategy with 11% of all U.S. firms offering incentives for early

retirement. It may have an undesirable, rapid reduction effect if not controlled. Dupont accomplished a three year 12,000-15,000 person reduction goal in sightly over a year. [Ref. 30:p. 29]

Kuzmits and Sussman (1988) point out that old corporate goals have been to retain quality people and foster a sense of mutual loyalty between employer and employee. Today however, the contemporary corporate goals stress success through attracting, developing, and retaining a competent, motivated work force. These two goals are fundamentally different. They also point out that downsizing strategies can inadvertently cut skilled or quality people. Dupont offered early retirement in an attempt to cut 6,500 workers and experienced double that figure in the numbers who volunteered for the program. Dupont was later forced to hire back some of these employees as consultants because it lost too many quality and vital people. [Ref. 28:p. 196] A similar program was offered at Manville Corporation and among the takers was the company president [Ref. 28:p. 196]. Seibert and Seibert (1989) have suggested that for these types of "pull" downsizing strategies, several restrictive offerings or windows should be developed [Ref. 31:pp. 80-81]. The Marine Corps VSI/SSB phased-offerings are good examples of three small and somewhat different windows.

One important lesson both Dupont and Manville learned was that quality people can get lumped into large sweeping

offerings of early retirement or early out incentive programs [Ref. 28]. Kuzmits and Sussman (1989) estimate that between 10%-20% of a corporation's high quality work force can be lost through voluntary early retirement and buy-out programs [Ref. 30:p. 31].

Early retirement/buy-out incentives must appear equitable within an organization. Employers should prevent employees from feeling that they were treated unfairly or received lower compensation. If the strategy is to accomplish the organizational reductions and if the organization wishes to lower downsizing anxiety among the workers, then this point best be taken to heart. [Ref. 32]

2. General Concerns About the Downsizing Environment

Conditions of downsizing normally occur during periods of economic depression and recession [Ref. 28]. Much of what has already been reviewed under organizational theory was accomplished under various conditions of the economy. Some studies, Price (1977) [Ref. 3], Bluedorn (1982) [Ref. 5], and Jackofsky (1984) [Ref. 6] included outside economic conditions within their variable set. In almost all cases these conditions had some type of significant effect on turnover. Cyclic economic downturns resulting in temporary work force reductions, historically in some industrial sectors, have been common (Feldman 1988) [Ref. 33]. Sutton (1987) [Ref. 34] and Whetten (1980) [Ref. 35] have recognized that downsizing may be a normative process, in that firms are created, they grow,

then decline, and possibly die. In an attempt to compare this type of environment to the military, one comes up short. Death of DOD will certainly not occur, at least from a practical perspective. Even though the downsizing environment may not be a unique phenomenon in the private sector, one can [illegible] is very unique within a military system of all volunteers. Threats of RIFs, more selective reenlistment criteria, increased promotion scrutiny, abolishment of service limits due to an "up or out" enlisted promotion policy, already exist within the Marine Corps today. The downsizing environment is alive and well in the U.S. military establishment.

Of equal concern with those who accept VSI/SSB or other exit incentive programs are the survivors of the downsizing phenomenon. Do employees retain the corporate mission and workload (operation tempo) with less help, due to reductions, or do operations scale down? What sense of job security exists now? Will I be allowed to stay as long as I perform well? These are typical questions being asked. Cameron, Freeman, and Mishra (1991) reported on results of a four year longitudinal study of organizational downsizing and redesign in 30 organizations in the U.S. automobile industry. Most of these were suppliers to manufacturers in the industry. They discovered downsizing tended to deteriorate organizational levels of quality and productivity. [Ref. 36] Ashford (1988) found that during AT&T's downsizing and restructuring

that employees who survived the action experienced stress caused by job uncertainty. Survivors must adapt to the post-reduction organization [Ref. 37]. Bridges (1986) studied the transition employees go through in this type of a situation. He saw workers go through a three part psychological process: 1) Disengagement, disidentification, and disenchantment, a letting go of the old role. 2) A neutral sense of disorientation, disintegration, and discovery. 3) Acceptance of the new job or role and any new purposes of the organization. [Ref. 38] Managers must assist survivors in their adjustment to the new work environment or even survivors of downsizing may be applying for early out incentives or become organizational attrition [Ref. 29].

Downsizing issues do assist in trying to understand the relationship between incentive strategies and how those strategies affect organizations in general and individuals in particular. These issues paint environmental pictures of the situations and conditions which exist and how individual behavior toward voluntary job turnover may be affected. Understanding the concepts of downsizing provides the context of this study.

E. CONCLUSION

After having reviewed organizational theory of job turnover, studies on U.S. military retention, and downsizing issues, it remains clear that research on specific issues in this area of study is both illusive and complex. The

interactions of variables, measurements, definitions, sample data, and conditions of the environment are very active and sensitive.

The literature and research is massive on job turnover and military retention; yet nothing has been done on the effects individual attributes and quality variables have on acceptance or rejection of voluntary incentive exit programs. One can surmise from the literature that even though much of the research was conducted over varying economic conditions, the quit behavior measured may in fact be drastically different from quit behavior of Marine enlisted service members found in the current, unique environment of downsizing. The additional unknown here is how this decision to stay or leave is made within the context of a monetary incentive exit program. Does the concept of SRBs have a similar effect in the case of exit bonuses? One can only speculate with the research that currently exists.

III. METHODOLOGY

A. INTRODUCTION

Many of the concepts of prior research together with a unique data set, unstudied by other researchers, led to the development of a methodology that incorporates both bivariate and multivariate analyses of an extensive array of archival variables. These variables proxy many of the variables described in the survey data mentioned in the previous chapter: job satisfaction, tenure, advancement or career opportunity, pay incentives, job search, demography, and quality.

The purpose of this study is to determine whether the Marine Corps is losing an inordinately high proportion of quality, careerist, enlisted Marines to the VSI/SSB separation incentive program. Another facet which is critical to the study is to profile the attributes which affect the probability that a careerist Marine takes the separation incentive program. With this goal in mind, it must also be remembered, as in much of the research done in organizational theory of job turnover and military retention, many variables have tremendous effect on each other, and these relationships ultimately affect job turnover, the dependent variable. One must assume this indirect-effect phenomenon will likely occur in this study. Even though a bivariate analysis would be the

easiest to understand, by itself it may not explain this interdependence or this effect individual variables have on one another. It may also not explain how that interdependency affects the dependent variable in this study, whether a Marine will take or not take the VSI/SSB separation bonus. Statistical, econometrical, multivariate analysis applied to survey data does not explain total causality, but it does provide statistical inferential evidence; therefore it will be useful to include both multivariate and bivariate analyses this thesis [Ref. 39:pp. 74-75].

In order to determine whether too many quality Marines are leaving due to the VSI/SSB program, a definition of quality must be developed in terms of variables available for measure and study. These quality variables will be the focus variables for this study. Bivariate profiling of these variables against takers/non-takers of VSI/SSB should help indicate the proportion of Marines with quality attributes who took the program and separated. The statistical significance of that information is unknown without additional multivariate analysis. An econometric model containing these quality (focus) variables and several control variables can be used to determine their level of effect upon the dependent variable, the probability a Marine will take the VSI/SSB program. From this model one can obtain inferential evidence necessary to balance and frame the information yielded by the bivariate profile. This thesis will employ cross- tabulation tables and

binomial logistic regression performed through the SAS Version 6 mainframe computer package. Together, these two analyses may offer the insight necessary to answer this study's research questions.

The binomial logit procedure appears to best model relationships which possess a binary type of dependent variable. In this case, the dependent variable is the choice an individual Marine makes, to take or not take the VSI/SSB, coded either as a one or as a zero dummy variable. Ordinary Least Squares (OLS) regression analysis has some serious defects when trying to model this kind of binary, dependent variable [Ref. 40:p. 216]. It is not within the scope of this thesis to consider the pros and cons of the various types of regression analysis techniques.

Specification of the multivariate model is crucial to the successful interpretation of its results. Theory surrounding the selection of variables is steeped in the theory mentioned in the previous chapter. Variable selection is also dependent upon the available data set, in this case, a data set furnished by Headquarters, U.S. Marine Corps (HQMC), Manpower Plans division, MPP-21, Washington D.C. This data set, an extract from the Headquarters Master File (HMF) is relatively easy to obtain and access by Marine Corps manpower planners. It is the data typically used for manpower policy decisions. The HMF is based on historical administrative information and is limited to its several hundred pre-established information

fields or variables. To better specify the model, the relationships, and the proxies, additional variables must be created through interactive combination or rescaling. The next section will explain variable creation and variable specification as it applies to the problem addressed in this thesis.

B. VARIABLE SPECIFICATION

The manner in which these variables will be categorized will be dependent upon whether they are focus variables (quality) or control variables. All control variables will be further classified by the characteristics they may proxy, based on the theory from Chapter II.

1. Focus Variables

All these variables will fall into the category of quality proxies. Each variable looks at a different attribute within a larger definition of quality. Naturally, not all desired quality attributes can be derived from an archival data set, and this data set is no exception. An attempt was made, however, to capture as many quality variables as realistically possible. A <u>specific</u> definition of quality is neither realistic nor necessary; rather, quality can be defined in terms of variables that can be measured or quantified and that are readily available to manpower planners.

a. PI

The quality of a careerist Marine is somewhat difficult to measure, but even in retention and organizational theory studies, an individual's performance, as evaluated by a supervisor, was used as a routine measure. Using this similar notion, the variable PI or performance index is a measure of this kind of performance. It ranges on a scale from 3.5, being the lowest performance mark, to 9.0, being the highest performance mark. Very little deviation (standard deviation .52) is measured due to the inflation of the performance evaluation system within the Marine Corps. PIs are derived from Marines' fitness reports received in their current grade. The marks given to a Marine in Section B blocks 13a-15a (See Appendix A) are averaged by report. These averages are in turn averaged over the total number of reports that a Marine has received in his/her current grade taken back no more than five years. This is the score assigned to that Marine. Whether the Marine performed within his/her military occupational specialty (MOS) or not does not affect the performance index. This then, provides a good overall job performance measure.

One problem exists within the automated system containing PIs. PIs for individuals will drop out of the system's data file if a Marine is recently promoted and has not received at least one fitness report in that new grade. An individual's PI will also drop out of the system if that

individual is discharged anytime during the period the HMF covers, or in other words before the closing date for that period of HMF data. The HMF is quarterly data which was merged with the PI data taken from an unrelated data file held by Manpower Management division, HQMC. The specifics of the problem will be discussed in the next chapter. The immediate problem with the variable is that half of the original sample fails to possess PIs. By using this very crucial variable, half of the original sample size must be deleted.

Jackofsky (1984) theorized job performance would affect a worker's perception of ease of movement and desirability of movement [Ref. 6]. Since Jackofsky or other researchers have never empirically tested this theory, results of this thesis could offer support/non-support for her contention.

b. GTGCTTOT

Many first term retention studies have measured quality in terms of Armed Forces Qualifying Test (AFQT) scores. AFQT scores, in many studies, have not been found to carry statistical significance in the second or succeeding reenlistments of military service members. Nevertheless, its relationship to other quality variables is not altogether clear. It is for this reason a measure of entry level intelligence be used in this thesis. Available in this data set was the GCT composite score. AFQT score data appeared

flawed and missing for a vast majority of the sample's observations.

The GCT score's correlation to AFQT scoring would appear to be the highest of any other composite score calculated from the Armed Services Vocational Aptitude Battery (ASVAB). The GCT score is made up of three of the four sub-scores which make up the AFQT score. Both of these composite scores are derived from word knowledge (WK), paragraph comprehension (PC), and arithmetic reasoning (AR). GCT includes mechanical comprehension (MC) while AFQT includes math knowledge (MK).[5] The name of the GCT variable in this study is GTGCTTOT.

c. COLL

Education level, in many studies, has usually been a demographic variable and in terms of high school education, will remain as a demographic control variable in this study. The education quality variable, for this thesis, will measure whether a Marine has completed any college. Just as officer retention studies have used graduate education as a quality measure (Bowman 1990), this study will use any college attendance as a quality measure of enlisted, careerist Marines [Ref. 41]. The dummy variable, COLL indicates whether a Marine has ever completed one or more years of college.

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[5]Telephone interview with Captain D.W. Hentsti USMC, Marine Corps Test and Measurement Officer, Headquarters, U.S. Marine Corps, Washington D.C.

d. F_RCTRDI

Within the Marine Corps exist two types of duty which entail an extensive screening and schooling process for enlisted, careerist Marines. Recruiting and drill instructor duty are both demanding and time intensive jobs. The Marine Corps selects quality performers from virtually every location and "walk of life" to round out these positions. It then screens these Marines for intelligence, moral turpitude, past performance, commitment to duty, and financial stability. Both prospective recruiters and drill instructors attend schools designed not only to impart requisite skills but to screen out potential duty failures. HQMC will assign those Marines who complete successful tours on either of these duties an additional MOS designating them as former recruiters (8411) or drill instructors (8511). The dummy variable created for this model is F_RCTRDI, which detects whether an individual has or does not have an additional MOS of 8411/8511.

e. N_ADDMOS

In somewhat a similar manner, additional MOSs are assigned to Marines. Marines achieve these additional MOSs by performing them on-the-job. Each Marine must demonstrate proficiency and consistent performance, with or possibly without formal training in that MOS. Graduation from a formal MOS training school could also qualify an individual for an additional MOS. Most commands will give only good performers

and those with demonstrated potential, possessing a genuine desire to learn, the opportunities which will culminate in an additional MOS assignment. As such, a dummy variable was created (N_ADDMOS) detecting any Marine who does not have at least one additional MOS.

f. NODUTY

Even though the data set being used shows very few observations of Marines in a non-full duty status, it still seemed logical to include a dummy variable that would capture whether a Marine fit into this category. Granted, this variable does not necessarily model any variability in performance, but it does pull out individuals that will most likely not be quality performers. Non-full duty status includes those pending medical separation/disposition, courts martials, administrative separation or anyone pending some other less than positive separation or disposition. The NODUTY dummy variable captures this attribute.

g. PFTSCORE

The final focus variable proxying quality attributes is PFTSCORE. This quantitative variable represents the last physical fitness test (PFT) score assigned to an individual Marine as of the date the data set was created. One would expect good all-around performers to have a higher than average PFT score, since the Marine Corps stresses both mental and physical toughness and discipline. Raw PFT scores

seem a better measure of physical achievement than PFT class which are age determined PFT score categories.

Table 1 summarizes the focus (quality) variables.

TABLE 1

LISTING OF THE FOCUS VARIABLES (QUALITY)

PI
GTGCTTOT
COLL
F_RCTRDI
N_ADDMOS
NODUTY
PFTSCORE

Source: Author

2. Control Variables

a. DEPLTIME

These variables will be classified in groups based upon the characteristics they appear to proxy. The first category will be those variables which seem to proxy job satisfaction. One element of job satisfaction in military service is the amount of deployment time one is required to serve. Great amounts of accumulated deployment time mean long periods away from immediate family or relatives. It means holidays are work days and on many deployments it means seven day work weeks and 12-16 hour work days. Deployment periods are normally very demanding and on many occasions "in harms

way." Marines can achieve allot of job satisfaction through successful deployments. The author theorizes however, there exists a point of diminishing returns due to family separation and separation from one's own country, culture, and life style. The variable used here is DEPLTIME and is a quantitative variable scaled in the number of months of accumulated deployed time an individual Marine possesses as of the closing date of the quarterly data file.

b. DAUS_DR1

Another variable that is similar, in that it deals with overseas duty and the time frame an individual has been back in the continental United States (CONUS) from an unaccompanied overseas tour is DAUS_DR1. It represents the number of years an individual has been back in CONUS from their last overseas, unaccompanied tour to 5 December 1991, the initial date the data was created. In other words, anyone in the zero years category has just returned from an unaccompanied or dependents restricted overseas tour within the last year prior to 5 December 1991. If an individual has a very mature DAUS_DR1 value, he/she may be anticipating orders to an overseas tour. This tour may not be a desirable assignment at this particular point in his/her career. On the other hand, if he/she just had completed an overseas unaccompanied tour which was very successful, he/she may have experienced tremendous job satisfaction. Either way, the

variable may have a significant effect on the decision to stay or take the separation bonus (VSI/SSB) and leave.

c. DCTB_YRS

Homesteading is an issue coming to the forefront of manpower management concerns. The Marine Corps hierarchy has discouraged homesteading for many years for a myriad of reasons, yet homesteading appeals to the individual Marine from a number of standpoints. Financially, homesteading is very lucrative for a Marine and his/her family. The Marine can eliminate relocation costs, have an opportunity to invest in a home, and the dependent spouse can maintain solvent employment. A variable which captures the individual's time at a current duty assignment is DCTB_YRS. This variable indicates the number of years a Marine has been in their current tour of duty, in the same location. It will be assumed that the longer one has been at the same location, the more satisfying to the Marine.

d. GEOBACH

A variable linked to a Marine's family situation is one that would capture the notion of geographic bachelorhood. Since this condition will be assumed to be an undesirable condition for most Marines, the idea of job satisfaction again enters the equation. One problem with this specific variable is how it was developed using archival data. The HMF identifies dependents' locations only by state as are the active duty members' duty station locations. The active

duty members' residence locations are not directly available in this data set. Manual data manipulation was required for those observations of active duty Marines stationed in locations which were within a reasonable commuting distance (1-1.5 hours commute time) from their dependent's location. One such example is the Marine working in Washington D.C. and the dependents residing in Virginia or Maryland. Another example is the Marine working in Kansas City, Kansas and the dependents living in Missouri. These types of situations and more, were considered and manually adjusted.

Some geographic bachelors would fail to be detected by using the programming technique mentioned in this thesis. An example, those Marines who work in a large state such as California and have dependents located elsewhere in that same state, too far for commuting, i.e., Marine working in 29 Palms CA with dependents living near Camp Pendleton, CA. Nevertheless, the GEOBACH dummy variable will pick up a majority of the geographic bachelors within the sample.

e. N_INMOS

The type of duty or job a Marine is assigned should have an effect on job satisfaction, especially if the job is outside the Marine's primary MOS or skill area. Two variables were created to pick up these effects. N_INMOS detects whether the Marine is currently serving a tour of duty outside of his/her primary MOS. The type of duty assignment

they currently are serving in is indicated by the duty variables listed below.

f. Duty Variables

All the below listed duty assignments were derived from Marine Corps major command codes (MCCs). FMF_DU are Marines currently serving in Fleet Marine Force (FMF) units. NFMF_DU are Marines serving at Marine Corps bases or major Marine Corps support establishments supporting or hosting FMF units. SECUR_DU encompasses Marines on security duty such as Marine Security Guards (MSGs) duty at U.S. embassies abroad, Marine Corps Security Forces (MCSF), Marine detachments afloat, and Naval Security Groups. RCTG_DU includes those Marines assigned to Marine Corps recruiting stations, districts, and officer selection stations. SCH_DU includes those Marines either assigned as a student or as a permanent member of a school command. Separation between the two could not be accomplished using the current data set. The last category (INDEP_DU) encompassed everyone else who was assigned duty independent of major Marine Corps commands or establishments. These include Marines on inspector/instructor duty at Marine reserve centers, those assigned to aviation detachments, Reserve Officer Training Corps (ROTC) units, Marine liaison and support offices, military advisor groups, area auditor groups, and Department of the Navy/Defense independent billets. Each of these variables are dummy variables. Table 2 summarizes all job satisfaction variables.

TABLE 2

LISTING OF CONTROL VARIABLES
(JOB SATISFACTION)

DEPLTIME
DAUS_DR1
DCTB_YRS
GEOBACH
N_INMOS
FMF_DU
NFMF_DU
SECUR_DU
RCTG_DU
SCH_DU
INDEP_DU

Source: Author

g. YOS/AGE/TIG

Another category of control variable is the tenure proxy. YOS or years of service and AGE are the only two variables created to pick-up how long a Marine has been in the Corps. The time in grade variable (TIG) is used primarily to proxy an individual's perception of promotion and advancement opportunities rather than tenure. A greater discussion of the effect each of these variables have on one another in a multivariate model, will be accomplished in the next chapter.

h. NREBONUS/ADD_PAY

Pecuniary incentives or pay opportunities comprise yet another category to be considered. Here such dummy variables as NREBONUS will be used. This variable reflects whether a Marine has never received a reenlistment bonus. The ADD_PAY variable indicates if a Marine is currently receiving either special pay or proficiency pay. Both of

these payments are additional pay that Marines receive for either special duty, hazardous duty, or extraordinarily demanding duty. This quantitative variable is represented by increments of $25, to better measure the effect the variable may have on the model's dependent variable, take or not take the VSI/SSB. A value of two equals $50 additional pay while a value of 8.8 equals $220 of additional pay.

i. ADSPOUS

Whether a Marine has an active-duty spouse greatly affects the family income. As this has a significant effect on pay opportunities, it may also have an effect on job satisfaction, in that the Marine Corps normally requires both spouses to work full time, be available for worldwide assignment, and potentially be stationed apart. Regardless, the ADSPOUS dummy variable will be classified under pecuniary opportunities. Tables 3 and 4 summarize tenure, advancement opportunity, and pecuniary incentive variable proxies.

TABLE 3

LISTING OF CONTROL VARIABLES (TENURE & ADVANCEMENT OPPORTUNITIES)

<u>Tenure</u>
YOS
AGE
<u>Advancement Opportunities</u>
TIG

Source: Author

TABLE 4

LISTING OF CONTROL VARIABLES
(PECUNIARY INCENTIVES)

NREBONUS
ADD_PAY
ADSPOUS

Source: Author

j. TT_EAS/TT_EASSQ/CONT_EXP

Both Mobley (1977) and Bluedorn (1982) have proposed that job search leads to intentions to quit or stay in a particular job situation. It is important then to attempt to proxy this relationship. Three variables were created CONT_EXP or contract expired, TT_EAS or time to end of active service (EAS), and TT_EASSQ which is TT_EAS squared. The rationale for TT_EASSQ is that the author hypothesizes that if the time to EAS was close (low value) then the probability to job search and leave would possibly be high, but as the time to EAS became greater, the probability to job search and possibly leave would reach a pinnacle then begin to decline as in a quadratic function. TT_EAS is scaled in months.

CONT_EXP is a dummy variable. It will be used in the Heckman model, which will be explained further in the Model Specification section of this chapter. The dependent variable of the Heckman model will be the choice between a Marine having or not having a PI. Remember that an observation would not have a PI associated to it if that individual

had been discharged during the period included in the cross sectional data set, from 1 December 1991 to 31 May 1992. CONT_EXP identifies those people who had an EAS during that period. Their contract expires, per se.

k. Race/Education/Marital/Gender/Citizenship

The final categories of control variables will include demographic, grade, and occupation, variables. All of these have had tremendous effects on many multivariate studies mentioned in Chapter II.

Demographic variables included in this model are, race (CAUC, BLCK, OTHR), education (HSG, NHSG), whether a Marine is a non-native born U.S. citizen (NBORNCIT), marital status (MARRIED, DIVORC, SINGL), and gender (FEMALE). Each of these are dummy variables. The only quantitative demographic variable is NUMDEP, or the number of dependents a Marine possesses.

l. E5/E6/E7

Grade variables are broken down by pay-grades, E5, E6, and E7. These dummy variables include only those grades that were eligible for the VSI/SSB separation incentive program. E4s were not used, even though they were eligible, since they do not receive fitness reports, and consequently are not assigned PIs.

m. Occupational Fields

Occupational field (occ field) variables had to be aggregated into logical groupings since the Marine Corps has

36 enlisted occupational fields. For purposes of this thesis, six groupings were created. Table 5 lists the occupational fields included within each grouping or variable.

TABLE 5

OCCUPATIONAL FIELD GROUPINGS/VARIABLES

Variable	Occupational Fields
ADMINSUP	Personnel and Administration Supply Administration and Operations Food Service *
CMBTARMS	Infantry Tank and Assault Amphibious Vehicle Artillery
CSS_NT	Intelligence Logistics Engineer, Construction, and Equipment Ordnance Ammunition and Explosive Ordnance Disposal * Operational Communications Motor Transport Nuclear, Biological, Chemical Aviation Ordnance Aviation Safety *
CSS_T	Utilities Signals Intelligence/Ground Electronic Warfare Data Systems * Aircraft Maintenance Air Control/Air Support/Anti-air Warfare Air Traffic Control and Enlisted Flight Crews *
GARSUP	Printing and Reproduction Traffic Management Auditing, Finance, and Accounting * Marine Corps Exchange * Public Affairs Training and Visual Information Support Music Military Police and Corrections Weather Service * Airfield Services U.S. Marine Drum & Bugle Corps

TABLE 5 (CONTINUED)

ELECAVN	Electronics Maintenance Data/Communications Maintenance Avionics

* Not represented in the sample.

Source: Author

Tables 6-9 summarize the job search, demographic, grade, and occupational field variable proxies.

TABLE 6

LISTING OF CONTROL VARIABLES
(JOB SEARCH)

CONT_EXP
TT_EAS
TT_EASSQ

Source: Author

TABLE 7

LISTING OF CONTROL VARIABLES
(DEMOGRAPHIC)

CAUC
BLCK
OTHR
HSG
NHSG
NBORNCIT
MARRIED
DIVORC
SINGL
FEMALE
NUMDEP

Source: Author

TABLE 8

LISTING OF CONTROL VARIABLES
(GRADE)

E5
E6
E7

Source: Author

TABLE 9

LISTING OF CONTROL VARIABLES
(OCCUPATIONAL FIELD)

ADMINSUP
CMBTARMS
CSS_NT
CSS_T
GARSUP
ELECAVN

Source: Author

C. MODEL SPECIFICATION

The statistical procedures of choice, as previously mentioned, will be the use of bivariate cross-tabulation tables and binomial logit regression analysis.

1. The Heckman Procedural Model

Since only one-half of the total sample have PIs and the goal is to use PI as a the crucial quality (focus) variable, only those observations having PIs must be selected out of the original sample and used. The problem this may cause is selectivity bias. By selecting out a sub-sample based on those observations having PIs, as opposed to using a

sample drawn from acceptable, statistical, random sampling, selectivity bias may have been introduced into the model. To compensate for this potential bias, it is necessary to use a procedure which will detect and "control for" any selectivity bias introduced. The Heckman procedure will be used in this study to accomplish just that feat. [Ref. 42]

By specifying a logit regression model composed of independent variables which would potentially influence and affect the dependent variable, in this case, the probability a Marine in the original sample has a PI, a predicted value can be created (BIASSAS) for the entire sample. By taking this predicted value/new variable, which is the calculated probability a particular Marine has a PI, and by taking its odds ratio:

$$\frac{BIASSAS}{1\text{-}BIASSAS}=BIAS$$

a final independent variable (BIAS) is created. It is this new variable which will then be placed in the main model using the sample of only those observations having a PI. Once the main logit model has been run, statistical significance of the BIAS variable can be determined. If the variable proves statistically significant, then selectivity bias probably exists, and the presence of the BIAS variable together with its parameter estimate in the model, controls for it. If, on the other hand, the variable is statistically insignificant, then selectivity bias most likely does not exist. [Ref 42]

Since the absence of a PI indicates recent promotion or discharge, variables were specified which would best model those two occurrences. Table 10 contains the Heckman model specification with the hypothesized signs.

TABLE 10

HECKMAN MODEL SPECIFICATION
WITH HYPOTHESIZED SIGNS

Variable	Effect on Promotion	Effect on Discharge	Overall
NODUTY	-	+	+
NHSG	-	+	-
COLL	+	+	+
F_RCTRDI	-	-	+
PFTSCORE	+	+	+
N_ADDMOS	-	-	-
DEPLTIME	-	+	+
DCTB_YRS	-	-	-
DAUS_DR1	-	-	-
GEOBACH	-	-	-
BLCK	-	+	+
OTHR	-	-	-
DIVORC	-	+	+
SINGL	-	+	+
AGE	-	+	+
FEMALE	-	-	+
TIG	-	+	+
ADD_PAY	-	-	-
NREBONUS	-	+	+
CONT_EXP	+	+	+
E5	+	+	+
E7	-	+	+

Source: Author

The following variables were not included in the model in order to prevent perfect multicollinearity: HSG, CAUC, MARRIED, and E6. These variables had the highest frequency, within their category, within the sample. It must also be noted that the reliability of the overall hypothesized signs are not very good. Many of these variables would affect the probability of being promoted in one direction while affecting the probability of being discharged in the other direction. The degree to which direction would be affected would result in the overall sign. It is very difficult to estimate that effect or even explain it. This is the rationale for having three columns for hypothesized signs in Table 10.

2. The Main Logistic Model

The main model is composed of independent variables which would potentially influence and affect the dependent variable, or the probability an individual Marine will take the VSI/SSB exit bonus. Table 11 lists the variables and their hypothesized signs for the main logit regression model.

TABLE 11

MAIN MODEL SPECIFICATION

Variable	Hypothesized Sign	Variable	Hypothesized Sign
NODUTY	-	OTHR	-
NHSG	-	DIVORC	+
COLL	+	SINGL	-
GTGCTTOT	+	NUMDEP	-

TABLE 11 (CONTINUED)

Variable	Hypothesized Sign	Variable	Hypothesized Sign
PI	-	AGE	-
F_RCTRDI	+	FEMALE	+
PFTSCORE	-	TIG	+
N_ADDMOS	-	ADSPOUS	-
DEPLTIME	+	ADD_PAY	-
DCTB_YRS	-	NREBONUS	+
SECUR_DU	+	ADMINSUP	+
NFMF_DU	-	CSS_T	+
RCTG_DU	+	CSS_NT	-
INDEP_DU	+	GARSUP	+
SCH_DU	-	ELECAVN	+
DAUS_DR1	+	E5	+
N_INMOS	+	E7	+
GEOBACH	+	TT_EASSQ	-
NBORNCIT	-	BIAS	?
BLCK	-		

Source: Author

The omitted conditions to prevent multicollinearity are HSG, CAUC, MARRIED, FMF_DU, CMBTARMS, and E6. Chapter V will further explain these models, variables, signs, and coefficients. One reason for the large number of independent variables is the desire to control for as many aspects of quit behavior as possible, so the independent effects of the

quality variables can be measured and interpreted with a sense of confidence.

A second reason is to lend some sense of reliability and consistency to the bivariate information by obtaining the statistical significance and signs of an assortment of variables from the multivariate model. As previously discussed, this will provide added depth to any bivariate information obtained. Quality Marines are not the sole concern of HQMC and this study. The profile of those taking the VSI/SSB incentive is also important to policy decision makers for refining or modifying current separation incentive policy decisions. The bivariate analysis aids tremendously in determining this profile.

IV. PRESENTATION OF DATA COLLECTED

The data set furnished by HQMC was created from the Headquarters Master File (HMF). The HMF is created quarterly and contains approximately 440 fields of information. Since this study is concerned about fiscal year (FY) 1992 phase I-III offerings of the VSI/SSB program, the extract of the HMF includes cross-sectional data taken during the period when Marines needed to make the decision to accept or reject these VSI/SSB incentives. This period is December 1991 through May 1992.

The data set includes all Marines eligible for the three phased offerings. As discussed in Chapter III, E4s were dropped leaving E5s, E6s, and E7s. Other enlisted pay-grades were not eligible and are not included in the data set. Data not found in the HMF that were merged into this data set, were PI data. This data came from Manpower Management (MM) division, HQMC and came from sensitive, performance evaluation data files. This is the reason that half of the observations within the sample are missing PIs. Criteria used for basing the retention of information within data files is different between the HMF and the performance evaluation files.

The total number of observations at the beginning of the study was 9,772. Because of missing observations in some of the variables, the initial Heckman model was run using 8,821

observations. The large number of observations missing PIs reduced the sample size (n) for the main model to 4,232, still a relatively large sample.

The original sample size was used for the bivariate profile. This allowed for a more accurate look at actual FY92 VSI/SSB results. An administrative close-out date of 30 June 1992 was established for those Marines taking the FY92 VSI/SSB. The 1,013 total takers by 30 June were merged into this data set for use as the response variable. Total FY92 takers, however, totaled 1,083 by the end of the fiscal year. Some 70 takers, or 0.7% of the overall sample, were treated as non-takers in this study due to the pre-established close-out date.

Profiling and scrubbing the data encompassed using three statistical techniques, creation of frequency tables, the running of simple correlations, and the use of cross-tabulation tables. Frequencies for the variables of the first or larger sample are located in Appendix B, while frequencies for the smaller sample (those with PIs) are included in Appendix C.

Certain variables were eliminated because of large numbers of missing values, i.e., AFQT scores and a variable for weight control and military appearance. A majority of the variables were well represented by a large percentage of overall observations.

Results of the Pearson simple correlation analysis warned of some collinearity problems. YOS had a high correlation with E5, E7, AGE, TIG, and PFTSCORE. TIG was highly correlated with YOS, TT_EAS, and AGE. Finally, AGE showed a high correlation with PFTSCORE, TIG, YOS, E5, and E7. Table 12 shows the Pearson correlation coefficients describing the relationships stated above.

TABLE 12

PEARSON CORRELATION COEFFICIENTS

	YOS	TIG	AGE
YOS	1.00	.37	.79
TIG	.37	1.00	.30
AGE	.79	.37	1.00
E5	-.43	.18	-.36
E7	.59	-.22	.47
PFTSCORE	-.28	-.14	-.28

Source: Author

No other significant problems or relationships surfaced from simple correlation analysis. To get a better idea of true multicollinearity within both multivariate models, linear probability OLS regressions were run using the variance inflation factor (VIF) procedure (See Appendix D). This procedure detects collinearity which ultimately makes the parameter estimates in a logit regression unstable and consequently less reliable [Ref. 39:pp. 274-276]. Both models

indicated YOS as having the most collinearity, followed by AGE, TIG, and E7. After pulling YOS out of both models, all other variables registered within normal VIF parameters. Instead of using YOS for a tenure variable, AGE was used for two reasons. First, prior studies have found AGE to be a statistically significant variable in affecting job satisfaction and job turnover. Secondly, AGE was also found to be statistically significant in the OLS regression in the main model.

In order to ensure some detectable effect and variation between the independent variables and the dependent variable in both models, cross-tabulations were done. It was important, for the specification of the main model, to see if takers of the VSI/SSB were represented within each of the dummy variable categories. If this did not occur, the model could not produce a coefficient (parameter estimate) for the variable(s) having no VSI/SSB takers. Without some takers in each category, the model cannot measure effects of that independent variable on the dependent variable. Similarly, for the Heckman model, it was important to see if those who possessed PIs were represented in each of the dummy variables being specified in that equation. It was discovered that all the variables originally to be included in the main model, had representative VSI/SSB takers. The variables in the Heckman model also had sufficient representation of those having a PI.

Appendices E and F display cross-tabulations for the Heckman model and the main model, respectively.

In order to interpret the coefficients of the main logit model, in terms of a base case representing the "average Marine" eligible for the VSI/SSB program, it was necessary to determine statistical means for all of the quantitative variables. These means are listed in Table 13.

TABLE 13

MEANS & STANDARD DEVIATIONS OF QUANTITATIVE VARIABLES

Variable	Means	Standard Deviation
DEPLTIME	1.94	3.14
NUMDEP	2.57	1.45
DCTB_YRS	1.27	1.65
AGE	33.03	3.70
TIG	3.97	2.41
DAUS_DR1	4.51	4.53
ADD_PAY	0.92*	2.46
YOS	13.35	3.01
GTGCTTOT	106.46	14.55
PI	8.43	0.52
PFTSCORE	217.16	64.70
TT_EASSQ	1114.99	1250.01
BIAS	1.81	1.33

* Value expressed in $25 increments.

Source: Author

The following variables were omitted from the main model to prevent multicollinearity: duty type (FMF_DU), marital status (MARRIED), race (CAUC), and occupational field (CMBTARMS). Table 14 displays the variable coding for the Heckman model. Note that two variables in the Heckman model REBONUS and ADDMOS are coded slightly different than two similar variables in the main model, NREBONUS and N_ADDMOS. The only difference is interpretation of the sign of each set of variables. This was done for ease of calculation and interpretation of the coefficients of the main model. Table 15 displays variable coding for the main model.

TABLE 14

HECKMAN MODEL
DUMMY VARIABLE CODING

Variable	Explanation	Coding
NHSG	Non-high school grad.	1 = Yes 0 = Otherwise
COLL	Possesses some college.	Same
F_RCTRDI	Former recruiter or drill instructor.	Same
ADDMOS	Possesses an additional MOS.	Same
GEOBACH	Is a geographic bachelor.	Same
BLCK	Race is black.	Same
OTHR	Race is other than black or caucasian.	Same
DIVORC	Marital status is divorced.	Same
SINGL	Marital status is single.	Same
FEMALE	Gender is female	Same
REBONUS	Has received a reenlistment bonus.	Same
CONT_EXP	Has an active duty service contract to expire between 1 Dec. 91 - 31 May 92.	Same
E5	Is an E5 or sergeant.	Same
E7	Is an E7 or gunnery sergeant.	Same

Source: Author

TABLE 15

MAIN MODEL
DUMMY VARIABLE CODING

Variable	Explanation	Coding
NODUTY	Currently in an other than full duty status.	1 = Yes 0 = Otherwise
NHSG	Non-high school grad.	Same
COLL	Possesses some college.	Same
R_RCTRDI	Former recruiter or drill instructor.	Same
N_ADDMOS	Does not possess an additional military occupational specialty.	Same
SECUR_DU	Currently serving on security duty.	Same
NFMF_DU	Currently serving on non-FMF duty.	Same
RCTG_DU	Currently serving on recruiting duty.	Same
INDEP_DU	Currently serving on independent (other) duty.	Same
SCH_DU	Currently serving on school duty, student or staff.	Same
N_INMOS	Serving on a tour not in one's primary MOS.	Same
GEOBACH	Is a geographic bachelor.	Same
BLCK	Race is black.	Same
OTHR	Race is other than black or caucasian.	Same
NBORNCIT	Not a born U.S. citizen.	Same
DIVORC	Marital status is divorced.	Same
SINGL	Marital status is single.	Same
FEMALE	Gender is female.	Same
NREBONUS	Has never received a reenlistment bonus.	Same
ADMINSUP	Possesses an administration/supply occ field.	Same
CSS_T	Possesses a technical combat service support occ field.	Same
CSS_NT	Possesses a non-technical combat service support occ field.	Same
GARSUP	Possesses a garrison support occ field.	Same
ELECAVN	Possesses an electronic or aviation occ field.	Same
E5	Is an E5 or sergeant.	Same
E7	Is an E7 or gunnery sergeant.	Same

Source: Author

Within this data set, as with most data, come problems with variable make-up. Already mentioned are GEOBACH and some of the duty variables. The largest problem variable with the duty variables is SCH_DU. Marine Command Codes (MCCs) lumped students and staff together under the same school codes. This makes it extremely difficult, virtually impossible, to separate students from staff [Ref. 43]. Nevertheless, with only 6.9% of the overall sample size being grouped into SCH_DU, a further breakout of students and staff would be very small.

The final concern with this data set is the degree it represents a random cross-section of all enlisted, careerist Marines. It is somewhat selective in terms of the VSI/SSB eligibility criteria listed below:

- Has served on active duty for more than six years before 5 December 1991.

- Has completed the initial term of enlistment including any extensions thereto, or the initial period of obligated service prior to separation.

- Has served at least five years of continuous active duty immediately preceding the date of separation.

- Is not immediately eligible for retired or retainer pay based on military service upon separation.

- Is a regular officer or enlisted or a reserve officer on the active duty list.

- Must be eligible for reenlistment in accordance with MCO P1040.31_ para. 4102(A)-(Q).

- Must possess an MOS listed in one of the three ALMARS published for the phase I-III offerings of VSI/SSB. [Ref. 44:p. 3]

The last two criteria, listed above, lend themselves toward the introduction of selectivity bias of the study's sample. Obviously, not all careerist Marines will be eligible for reenlistment. This automatically eliminates a lower caliber or lower quality Marine from the sample. This is particularly important to remember, when in the next chapter, the discussion of lower quality Marines will not include those ineligible for reenlistment. In other words, lower quality will refer only to those lower quality Marines within the sample.

Secondly, the last criterion selects out only those MOSs listed by HQMC in the three basic ALMARS (007-92, 064-92, and 133-92). As already discussed in Chapter I, the MOSs represented are those MOSs for which related equipment is being phased out of DOD inventories, or those suffering from promotion stagnation. This does not include every MOS within the Marine Corps, but it does include 28 of the 36 enlisted occupational fields [Ref. 45]. Those occupational fields not represented are Ammunition and Explosive Ordnance Disposal (23), Food Service (33), Auditing, Finance, and Accounting (34), Data Systems (40), Marine Corps Exchange (41), Aviation Safety (66), Weather Service (68), and Air Traffic Control and Enlisted Flight Crews (73). These fields are included in every occupational variable category developed for this study except CMBTARMS and ELECAVN (See Table 5). Even with the absence of eight occupational fields, the aggregation of these

fields into job-type categories or groupings should provide sufficient job related characteristics to generate variable interaction within the main model, even if some occupational field-specific influences are not present.

Even though selectivity bias may exist within the sample, it remains to be seen if at any time in the future all MOSs will be open to the VSI/SSB program, or that reenlistment-ir[illegible]ble Marines will be offered a VSI/SSB or similar type program. The point to be made is that the overall population of enlisted, careerist Marines may never entirely be eligible for separation incentive programs such as the VSI/SSB. The concern (selectivity bias) then may be, how does a researcher best sample this new population. Even under this new criterion, the sample in this study, with half of the original sample eliminated because of the lack of data on the PI variable, would still potentially possess selectivity bias. Again, that's the purpose for the Heckman procedure.

Finally, it is important to reiterate, the data set used in this study has never been used before, by other researchers. As in many studies such data sources as the U.S. Census Bureau, the 1974 Enlisted Utilization Survey, the National Longitudinal Survey of Youth 1979-1987, the 1985 DOD Member Survey, etc. have been worked and reworked. The data set in this study is unique and readily accessible to manpower planners. It possesses actual quit behavior, existing performance measures, and a wide selection of archival

information suited to proxy many aspects of human behavior for the study of job turnover in a downsizing environment.

V. DATA ANALYSIS AND INTERPRETATION

A. INTRODUCTION

The organization of Chapter V is designed to facilitate understanding of the empirical results obtained by both the bivariate and multivariate analyses that have been tied directly into each research question. Since some questions rely on both analytical techniques, it better serves the purpose of understanding to introduce the results and interpretations together, in direct response to the questions, namely the main research question and the four subsidiary questions. Consequently, this chapter will be broken into two major sections. Each section will attempt to address the research questions through a series of quantitative interpretations and qualitative assessments.

B. MAIN RESEARCH QUESTION

Are a disproportionate number of quality Marines taking the VSI/SSB voluntary separation bonuses? One key to addressing this question is to define, "quality Marine." In fact, one of the subsidiary questions is, "What are some potential variables to proxy the quality characteristics of enlisted Marines?" This question was essentially answered in Chapter III. Through that detailed description and specification, seven variables to proxy quality were identified and extracted from the data set: PI, NODUTY, COLL, GTGCTTOT,

F_RCTRDI, N_ADDMOS, and PFTSCORE (See Table 16). The author defines quality in terms of these seven quantifyable variables. These variables revolved around the notion of overall job performance, not the degree of technical training or job criticality. Using this workable and quantifyable definition of quality, the main research question can be addressed.

TABLE 16

QUALITY VARIABLE DESCRIPTIONS

Variable	Description
NODUTY	Currently in an other than full duty status.
COLL	Possesses some college.
F_RCTRDI	Former recruiter or drill instructor.
N_ADDMOS	Does not possess an additional military occupational specialty.
PI	Performance index calculated from Marine Corps fitness reports.
PFTSCORE	Score on Marine Corps physical fitness test.
GTGCTTOT	GT score from ASVAB test.

Source: Author

Table 17 reflects the results of a bivariate cross-tabulation made between takers of the VSI/SSB program and each of the four dummy quality variables, plus four successive categories of PI. Displayed are three columns of numbers. The first column is the take rate expressed as a percentage of those Marines taking VSI/SSB who possess the quality attribute

represented by the variable. The second column represents the same takers but expressed as a percentage of the total takers in the original sample (931). The third column represents the number of Marines who possess the attribute as a percentage of the total original sample (9,118) of Marines. Columns two and three are meant for direct comparison.

TABLE 17

BIVARIATE RESULTS
QUALITY VARIABLES

Variable	Take-Rate	Percentage of Total Takers	Percentage of Total Sample
Average	10.21	--	--
PI 7.5-7.9	16.48	0.86	0.62
PI 7.5-7.9	17.55	2.63	1.78
PI 8.0-8.4	15.84	0.86	5.17
PI 8.0-8.4	9.62	7.88	10.04
NODUTY	3.45	0.11	0.32
COLL	8.24	8.70	10.78
F_RCTRDI	6.55	17.08	26.64
N_ADDMOS	12.28	55.32	45.99

Source: Author

To determine whether a disproportionate number of quality Marines are taking the VSI/SSB, it is necessary to see the profile of those taking within an attribute compared to the total number in the sample. The average take-rate for the entire sample was 10.21%. The take-rate for each quality attribute can be compared to the entire sample's average take

rate to see if a greater/less proportion of Marines are taking the program. In a similar manner, columns two and three show a comparison between the percentage of total takers within an attribute and the percentage of that attribute represented in the total sample. If both percentages are similar, then the percentage of total takers characterizes about the same representation as that attribute does within the total sample. Take-rates will also be very close to the average take rate of 10.21 in this instance.

These two methods of comparison give the same result but from slightly different perspectives. The second method provides some idea of the magnitude of the representation of Marines within an attribute and how that might affect the overall sample. As discussed in Chapter III, the bivariate results are based on the original or larger sample. This provides an idea of what actually happened in FY92, by attribute.

Note, that since PI was a quantitative variable, it was broken down into four components. Thus broken down, it was included with the dummy variables in the bivariate analyses. The effect of the other two quantitative variables would be observed through the multivariate model, i.e., the sign, which would indicate the direction of their relationship with the dependent variable. Also requiring extraction from the multivariate model is the level of significance of each of the quality variables. The intent is to determine if there is any

statistical significance in the effect of the independent variables on the dependent variable. Statistical significance would strengthen the results of the bivariate analysis.

Table 18 shows the results of the main logit regression on the quality proxies. Appendix G contains the actual SAS readout of the logistic procedure.

TABLE 18

MULTIVARIATE (LOGIT) RESULTS
QUALITY VARIABLES

Variable	**Coefficient**	**P-Value**
NODUTY	-1.0344	0.3458
COLL	-0.3884	0.0915**
GTGCTTOT	-0.00421	0.3331
PI	0.00117	0.9909
F_RCTRDI	0.3431	0.0784**
PFTSCORE	-0.00247	0.0032*
N_ADDMOS	0.3775	0.0091*

* Significant at the 0.05 level.
** Significant at the 0.10 level.

Source: Author

Table 18 shows four quality variables as statistically significant: PFTSCORE and N_ADDMOS at the .05 level and COLL and F_RCTRDI at the .10 level. The other three quality variables are considered to have statistically insignificant effects on the probability that a Marine will take the VSI/SSB incentive.

In other words, each quality variable may have a higher/lower take rate than the sample's average, but according to the main logit model the effects of PFTSCORE, N_ADDMOS, COLL, and F_RCTRDI may also significantly contribute toward a Marine's decision to take/not take the VSI/SSB while NODUTY, GTGCTTOT, and PI do not necessarily affect this decision. Remember, these effects are from individual variables, all other independent variables in the equation held constant (ceterus peribus). This result may imply that certain quality variables based on performance may potentially have an influence on a Marine's job-turnover decision within an environment characterized by downsizing and pecuniary voluntary separation incentives.

The bivariate comparisons indicate that all PI groupings but one have a higher-than-average take-rate. The best performers (PI 8.5-9.0) have lower than average take rates (9.62%). However, the logit model suggests PI does not necessarily affect the decision to take VSI/SSB. In addition, the sign for PI is positive suggesting the higher the PI the greater probability a Marine will take VSI/SSB. One must interpret then that the bivariate profile shows that in FY92 very high performers stayed in while the balance took the VSI/SSB at higher-than-average rates. This result is not clear and definitely not conclusive. The higher performers may feel greater job security or that they may have greater career opportunities. It is difficult to assess this

perception since the multivariate model suggests that the variable PI has no linear relationship with job-turnover behavior in this situation.

Results for NODUTY include a lower-than-average take-rate, 3.45%, and an insignificant logit coefficient with a negative sign. Again, the logit model suggests NODUTY may have no independent effect on the dependent variable. The bivariate profile shows that for FY92 those on a no-duty status tended to take at a much-less-than-average rate.

The final insignificant quality variable included in the model was GTGCTTOT. Even though it had a negative sign, suggesting the higher the GT score the lower the probability of taking VSI/SSB, the insignificance indicates a potential lack of effect. This doesn't appear surprising based upon much of the previous research which has been inconclusive upon whether Armed Forces entrance test results affect careerist retention.

N_ADDMOS was a significant variable at the 95% confidence level, and it had a positive relationship to the dependent variable. This suggests the lower-quality Marines, those not possessing additional MOSs, will have higher probabilities of taking the VSI/SSB. Bivariate results are consistent with this finding, showing a higher-than-average take-rate, 12.28%. One wonders if these Marines perceived a closing of opportunities within the Corps since they lack an additional

specialty. This in turn may influence their turnover behavior.

PFTSCORE was also significant at the 95% confidence level. The negative coefficient indicates the higher the score the less the probability of taking VSI/SSB. As with GTGCTTOT, a bivariate profile would not afford any additional insight. As discussed in Chapter III, the PFT score indicates a balanced excellence of a quality performer.

The model suggested that those Marines with some college (COLL) had less of a tendency to take VSI/SSB. This variable was significant at the 90% confidence level. The bivariate profile also was consistent with this finding, showing COLL as having a lower-than-average take-rate, 8.24%. This would suggest that those with some college tended to stay and that in FY92 they indeed did stay.

The final significant variable, F_RCTRDI, was significant at the 90% confidence level and possessed a positive coefficient. An interesting inconsistency exists with this variable. Even though the multivariate model suggests that having been a former recruiter or drill instructor has an independent effect of increasing the probability a Marine will take the VSI/SSB, the bivariate profile indicates that in FY92 former recruiters and drill instructors actually took the program at a much-lower-than-average rate. This makes drawing conclusions very difficult.

Generally speaking, the multivariate model indicated that some quality variables or attributes have a statistically significant effect on whether a Marine takes the VSI/SSB. The bivariate profile indicated historical take-rates for different categories of Marines based on FY92 data. Some inconsistency exists between the two analyses for some of the variables.

As for Marines with some college, additional MOSs and high PFT scores, there is statistical support to indicate that these Marines will have lower probabilities of taking the VSI/SSB than the average Marine eligible for the program. The bivariate analysis supports this contention with lower-than-average take-rates. Variables such as PI, GTGCTTOT, NODUTY, and F_RCTRDI either showed inconsistencies between multivariate and bivariate results or merely were statistically insignificant. Nevertheless, the bivariate profile for these last four variables does reflect FY92 data.

C. SUBSIDIARY RESEARCH QUESTIONS

Two of the four subsidiary questions have already been addressed. The first is, "What are some potential variables to proxy the quality characteristics of enlisted, careerist Marines?" Chapter III has adequately addressed this question within the context of the available data. The second question is, "What control variables should be used to best account for other factors affecting a Marine's decision to take/not take

the VSI/SSB bonus?" This has also been sufficiently covered in Chapter III.

A third question will be addressed here: "What may be the effect of the quality variables on the probability that a careerist Marine will take the VSI/SSB bonus?" In answering this question, one must determine, by using the coefficients in the main logit model, the magnitude of effect on the probability. Table 19 shows these effects for each of the significant quality variables identified in the "case" column.

TABLE 19

LOGISTIC REGRESSION COEFFICIENT INTERPRETATIONS QUALITY VARIABLES

Case	Percentage Probability	Change from Base Case (%)
Base	2.45	--
N_ADDMOS	3.54	1.09
PFTSCORE (10 points)	2.40	-0.05
COLL	1.68	-0.77
F_RCTRDI	3.42	0.97

Source: Author

These probabilities are calculated using the logistic equation:

$$P(TakeVSISSB) = \frac{1}{1+e^{-(\beta_0+\beta_1 X_1+...+\beta_k X_n)}}$$

This allows for the creation of a base case which represents the average Marine in the sample. By varying only one of the significant variables at a time, four independent cases were developed. Each case represents only the change in the one variable indicated in the case column. This allows for interpretation of the magnitude of effect on the probability resulting from a change in the variable relative to the base case. In the case of PFTSCORE, the results are based on a change of 10 points of PFT score.

The base case is based on the following average Marine profiled by this data set: A 33.03 year old, Caucasian, male, E6, on full-duty status, high school graduate with no college, having a GT score of 106.46, a PI of 8.43, not having a recruiter (8411) or drill instructor (8511) additional MOS but having at least one other additional MOS, a PFT score of 217.15 having 1.94 months of accumulated deployed time, having been at his duty station for 1.27 years, being on FMF duty, in his primary combat arms MOS, not a geographic bachelor, born a U.S. citizen, married but not to an active duty spouse, with 2.57 dependents, having 3.97 years in grade, receiving $24.25 in additional pay, having received a reenlistment bonus at least once, and having been back in the continental U.S. (CONUS) for 4.51 years since his last

unaccompanied overseas tour. This average Marine also has a TT_EASSQ of 1114.99 or 28.19 months to EAS. Finally, the BIAS value of this base case is 1.81.

It appears N_ADDMOS has the greatest effect, with a change from the base case probability of 1.09%. The other three variables have smaller effects. As previously discussed, these four variables may have a statistically significant effect on a Marine's decision to take VSI/SSB, but one can see by the coefficient interpretations that the effect of most of these quality variables is not very large.

This begs the question. Did any other variables within the model have significant effects? This question is embodied into the fourth and final subsidiary research question: "Of those Marines taking VSI/SSB, do trends appear in their attribute profile, and if so, what are those trends and their effects on the probability a Marine will take the bonus?"

Since it is beyond the scope of this thesis to analyze each of the control variables to the extent of the quality variables, the next several pages will focus on statistically significant trends identified from the main logit model. Some mention of the bivariate profile will also be made. Table 20 displays the control variables using the same format as Table 17. Table 21 lists the logit regression results for the control variables (coefficients and P-Values).

TABLE 20

BIVARIATE RESULTS
CONTROL VARIABLES

Variable	Take Rate	Percentage of Total Takers	Percentage of Total Sample
Average	10.21	--	--
SECUR_DU	8.77	3.97	4.63
FMF_DU	10.64	54.99	52.76
NFMF_DU	7.61	14.07	18.87
RCTG_DU	9.40	5.37	5.83
INDEP_DU	16.78	17.94	10.91
SCH_DU	5.34	3.65	6.99
N_INMOS	9.17	23.52	26.19
GEOBACH	10.40	27.28	26.79
BLCK	7.48	21.80	29.75
OTHR	9.87	6.34	6.56
CAUC	11.52	71.86	63.69
NBORNCIT	8.74	7.73	9.04
DIVORC	11.80	9.99	8.64
MARRIED	10.03	82.92	84.44
SINGL	10.46	7.09	6.92
FEMALE	11.62	5.48	4.81
ADSPOUS	12.52	7.09	5.78
NREBONUS	11.03	26.32	24.36
ADMINSUP	6.77	17.40	26.23
CMBTARMS	5.35	16.22	30.96
CSS_T	21.41	31.04	14.81
CSS_NT	8.16	8.27	10.35
GARSUP	9.21	6.02	6.67
ELECAVN	19.58	21.05	10.98
E5	26.56	46.62	17.92
E6	8.20	43.82	54.58
E7	3.55	9.56	27.50
NHSG	12.90	0.43	0.34
HSG	10.20	99.57	99.66

Source: Author

TABLE 21

MULTIVARIATE (LOGIT) RESULTS
CONTROL VARIABLES

Variable	Coefficient	P-Value
NHSG DEPLTIME	0.8057 0.00373	0.3290 0.8386
DCTB_YRS SECUR_DU	0.0276 0.4563	0.3899 0.1018
NFMF_DU RCTG_DU	-0.1064 0.1956	0.5287 0.5254
INDEP_DU SCH_DU	0.4974 -0.6451	0.0009* 0.0261*
DAUS_DR1 N_INMOS	-0.0231 -0.1678	0.0607** 0.2588
GEOBACH BLACK	-0.0166 -0.3999	0.8950 0.0054*
OTHR NBORNCIT	0.1514 0.0430	0.4709 0.8326
DIVORC SINGL	0.2662 -0.1079	0.1785 0.6528
NUMDEP AGE	0.0313 -0.0705	0.4789 0.0037*
FEMALE TIG	0.4723 -0.0115	0.0586** 0.7062
ADSPOUS ADD_PAY	0.2866 -0.00942	0.1969 0.7645
NREBONUS ADMINSUP	0.0431 0.0552	0.7210 0.7639
CSS_T CSS_NT	0.8800 -0.2685	0.0001* 0.2030
GARSUP ELECAVN	0.4617 0.8806	0.0678** 0.0001*
E5 E7	2.8448 -0.2559	0.0001* 0.3940
TT_EASSQ BIAS	-0.0004 -0.7134	0.0001* 0.0002*

* Significant at the .05 level. ** Significant at the .10 level.

Source: Author

Tables 22 and 23 provide for an interpretation of the magnitude of the effects on the probability that a Marine will take the VSI/SSB. Each of the statistically significant control variables are listed by case, with their corresponding percentage probability. This probability is calculated using the same logistic equation mentioned earlier in this chapter.

TABLE 22

LOGISTIC REGRESSION COEFFICIENT INTERPRETATIONS
CONTROL VARIABLES
(.05 significance level)

Case	Percentage Probability	Change from Base Case (%)
Base	2.45	--
INDEP_DU	3.97	1.52
SCH_DU	1.30	-1.15
CSS_T	5.72	3.27
ELECAVN	5.72	3.27
E5	30.20	27.75
BLCK	1.66	-0.79
AGE (1 Year)	2.29	-0.16
TT_EASSQ (6 Months)	2.42	-0.03
TT_EASSQ (12 Months)	2.32	-0.13

Source: Author

TABLE 23

LOGISTIC REGRESSION COEFFICIENT INTERPRETATIONS
CONTROL VARIABLES
(.10 significance level)

Case	Percentage Probability	Change from Base Case (%)
Base	2.45	--
FEMALE	3.88	1.43
GARSUP	3.84	1.39
DAUS_DR1 (1 Year)	2.40	-0.05

Source: Author

Nine control variables were statistically significant at the .05 level and three variables at the .10 level. These will be the variables discussed in the next several pages.

AGE, a tenure variable and E5, which could be interpreted as proxying very little tenure, were both highly significant. As AGE increased, the probability a Marine would take VSI/SSB went down. Conversely so with E5s, the results of which seem consistent with organizational theory on tenure's affect on job turnover. The magnitude of effects on the probability for each of these variables does differ. For every additional year of age, the probability is lowered .16%, whereas if a Marine is an E5 the effect on the probability is raised 27.75%. This is an astronomical effect within the context of this study. E5s cannot retire as sergeants due to service limitations. On the other hand, certain E6s and most E7s have an opportunity to reach 20-year retirement. This fact may be

affecting job-turnover behavior. Even though the E7 variable was not significant, it possessed a negative relationship (lowers the probability) with the dependent variable. This result also seems consistent with organizational behavior theory of job turnover.

The Marine Corps is targeting E5s under the current policy governing the VSI/SSB program. The bivariate profile also shows a tremendously high take-rate for E5s, 26.56%, while E6s and E7s have below-average take-rates, at 8.20% and 3.55%, respectively.

Two duty variables were significant at the 95% confidence level, INDEP_DU and SCH_DU. Interestingly, both had opposite effects with similar magnitudes. Those people on independent duty had a higher-than-average probability of taking the VSI/SSB, while conversely so for those in school or for permanent personnel assigned to school commands. INDEP_DU raises the probability of taking 1.52% and SCH_DU lowers the probability 1.15%. The bivariate profile is consistent with both sets of results showing INDEP_DU with a higher-than-average take-rate of 16.78% and SCH_DU at a lower-than-average take-rate of 5.34%.

Marines on independent duty have a higher-than-normal exposure to civilian counterparts, private businesses, and community activities while in the line of duty. The probability of Marines on this type of duty seeing greater employment alternatives or avenues would logically seem

greater, whereas on school duty Marines have virtually no contact with the civilian community through job-related activities.

School duty tends to be a reward for good performers, especially from the aspect of a student. It could mean a new and better job as a follow-on to school or it could mean perceived higher opportunities for promotion. Either way, both notions have been shown to increase retention behavior.

Two of the five occupational field variables were significant at the 95% confidence level (CSS_T, ELECAVN) and one at the 90% confidence level (GARSUP). As one might expect, the two most technical occupational fields, CSS_T and ELECAVN, had significant, positive relationships with the dependent variable. Both had the second greatest positive effect of all the control variables. Both CSS_T and ELECAVN had a 3.27% higher probability of taking VSI/SSB than the base case. This is not an unfamiliar phenomenon for the military services. The SRBs were designed to counter this type of phenomenon under normal environmental conditions of retention [Ref. 27]. It is logical that these specialties, with their high cost of training and high perception of marketability, would leave the Marine Corps at higher rates under conditions of voluntary separation bonuses in a downsizing environment. In fact, the bivariate profile shows ELECAVN and CSS_T Marines leaving at rates 9.37% and 11.20% higher than average.

Similarly, GARSUP had a significant positive relationship with the dependent variable. The magnitude of its effect was also relatively high. Marines in the GARSUP occupational field had a 1.39% higher probability of taking VSI/SSB than the base case, or average Marine. Inconsistency is born out with the take rates displayed in the bivariate profile results. GARSUP Marines took VSI/SSB at a rate 1% lower than the average Marine. This result makes it extremely difficult to explain what is happening or why this phenomenon exists. GARSUP Marines are not necessarily technically trained, but the Marine Corps gives them unique <u>general</u> training as opposed to technical <u>specific</u> training. This general training has historically been marketable within the civilian job market since it carries tremendous skill transfer from military to civilian occupations [Ref. 46:pp. 152-154]. It appears this factor may have a significant effect on a Marine's decision to take VSI/SSB, but it apparently did not necessarily affect the FY92 eligible population.

Two variables classified as demographic, BLCK and FEMALE were significant at the 95% and 90% confidence levels, respectively. The fact a Marine was black decreased the probability (.79%) of taking the VSI/SSB. Consistent with the bivariate results, blacks took the VSI/SSB at a rate 2.73% lower than average. Perceptions of job opportunities in the Corps, versus in the civilian community, may have some influence in a black Marine's decision to take or not take.

Traditionally, a high level of labor-market discrimination exists for blacks in the civilian labor market [Ref. 46:pp. 535-537]. The Marine Corps may be an alternative to avoiding being placed in such a market. Females, on the other hand, have a 1.43% greater probability of taking the VSI/SSB. Consistent with the bivariate profile, females took VSI/SSB at a 1.41% higher-than-average rate. Reasons for this could vary significantly. Elements such as an environment characterized by male dominance, sexual harassment, threat of combat duty, or new rising issues of mandatory combat arms MOS assignment, could be cause for distrust, anxiety, and consequently job dissatisfaction. Most reasons, including these, are speculative and not empirically supported.

The last control variable which was significant at the 95% confidence level was TT_EASSQ. This variable is difficult to interpret since it was modeled as a quadratic function. As such, Table 22 shows two separate cases for this variable. Each gives some idea of the level of magnitude TT_EASSQ had on the dependent variable. As time to EAS squared becomes greater, the probability that a Marine will take VSI/SSB gets lower. In the case of six months to EAS, the probability is reduced .03%, while 12 months to EAS reduces the probability .13%. Even though the effect is very small, it is a statistically significant phenomenon. Evidently, the decision to take VSI/SSB and leave the Corps occurs very near a Marine's end of active service.

This control variable hints at explaining why any E6s or E7s would take the VSI/SSB when retirement is so close. Either lucrative job offers exist or honest commanders inform those substandard performing E6s and E7s, with near term EASs, that the chance of reenlistment is remote. Without this reenlistment, the rapidly approaching retirement is no longer a reality.

The last control variable significant at the 90% confidence level was DAUS_DR1, or the number of years a Marine has been back in CONUS since the last unaccompanied overseas tour. For each year a Marine is back the probability he/she takes VSI/SSB is lowered .05%. As with TT_EASSQ, the effect is small. It appears to be yet another minor factor in influencing a Marine's decision to take or reject the VSI/SSB bonus.

A variable which must be explained that was included in the model as specified in Chapter III, is BIAS. Remember, the BIAS variable was the predicted value's odds ratio from the Heckman procedural model. The BIAS coefficient detects and compensates for possible selectivity bias created by selecting the sub-sample of Marines having the PI variable. This BIAS variable was significant at the .05 level, strongly indicating the presence of selectivity bias. The coefficient -0.7134 adjusts for this selectivity bias by ultimately influencing the magnitude of effect of the other variables through the logistic equation. Had not the Heckman procedure been used in

this study, drastically different results would have been realized, all because of selectivity bias.

Of the 11 significant control variables (excluding BIAS), all but one (GARSUP) had results consistent with the bivariate profile. These variables will be further discussed in Chapter VI.

D. SUMMARY

Four of the seven quality variables were statistically significant in the multivariate (logit) model. The bivariate profile displayed some interesting relationships, some of which were inconsistent with the multivariate analysis.

A total of 12 control variables (including BIAS) were statistically significant. Several relationships consistent with organizational behavior theory of job turnover and military retention existed. The bivariate profile for the control variables was consistent with the multivariate results in all but one case.

It must be noted that the bivariate profile covered virtually the entire FY92 eligible enlisted population (E4s excluded) for VSI/SSB, a total of 9,118 Marines. Of the total 1,001 FY92 <u>E5-E7</u> takers, this profile included 931 of those, or 93% of the total number of takers. Only 7% of the total takers were treated as non-takers by this analysis. The analysis thus yielded a very accurate profile of Marines who actually took the VSI/SSB program in FY92. This information, coupled with the statistically significant effects certain

variables had on Marines' decisions to take or not take the bonus, lead to some valid conclusions, which are discussed next, in Chapter VI.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

Chapter VI will present conclusions and recommendations based on the results of the preceding chapter. Specific research weaknesses are also addressed for the benefit of future researchers and interested readers.

An important caveat to drawing any conclusions from statistical data is the up-front concern of how the data are analyzed. The theme of bivariate-versus-multivariate analysis has prevailed throughout this thesis. There is no great "truth" here as to which of the two techniques is correct. Both can provide useful information and insights, and when each compliments the other the logical assumption which can be made is that each possesses strong inferential explanatory power for the data. Chapter V presented an array of results. One important consideration to keep in mind is that many characteristics of one variable were controlled by other variables within the multivariate model, i.e., Marines on INDEP_DU also typically draw additional pay and have additional MOSs, both of which are controlled for by the variables ADD_PAY and N_ADDMOS, also included in the model. This control assists in isolating as much independent effect one variable may possibly have on the probability a Marine takes VSI/SSB. This is a great statistical advantage of

multivariate econometric modeling. Bivariate analysis does not possess such statistical controls but does profile actual occurrences within a sample or population. Inferential explanatory power may be present in bivariate analysis; it simply lacks the statistical support of multivariate analysis.

It appears, though, in this thesis that most of the multivariate results are consistent with the bivariate results. A few exceptions exist. This chapter will finish answering various research questions that remain to be answered.

B. RESEARCH CONCLUSIONS

This section will attempt to answer the two remaining unanswered research questions: (1) Are a disproportionate number of quality Marines taking the VSI/SSB? (2) Of those taking the VSI/SSB, what trends appear in their attribute profile? The other research questions have been answered in Chapter III and Chapter V.

1. Question 1

The answer to the first question is unclear. As indicated in Chapter V, results are varied. Out of seven variables making up the definition of quality, four variables were significant. Of these four, PFTSCORE and COLL showed that high quality Marines are taking at a less-than-average rate and probability. F_RCTRDI showed inconsistency, not allowing for a clear-cut conclusion. The N_ADDMOS variable

showed, to some degree, lower-quality Marines are taking at a higher rate and with greater probability.

Other quality variables proved either statistically insignificant or were inconsistent in the bivariate/ multivariate comparison. Since the PI variable permitted for a bivariate profile to be made by score ranges, it is interesting to note in Table 24 the six highest performance indices. Table 24 is formatted in the same manner as Tables 17 and 20. Even though the average take-rate of these six high PI indices combined is below average, Table 24 shows only 31.35% of the overall sample as having lower-than-average take-rates (PI 9.0-8.8). Tables 17 and 24 show that about 68.65% are taking at a higher-than-average rate.

TABLE 24

BIVARIATE RESULTS
SIX HIGHEST PERFORMANCE INDICES (PI)

Variable	Take Rate	Percentage of Total Takers	Percentage of Total Sample (%)
Average	10.21	--	--
PI 9.0	4.56	2.81	7.50
PI 8.9	5.72	5.44	11.56
PI 8.8	9.46	9.57	12.29
PI 8.7	10.27	9.19	10.87
PI 8.6	12.93	10.69	10.05
PI 8.5	14.78	9.57	7.86

Source: Author

The PI variable, even though statistically insignificant, also has a positive relationship with the probability that a Marine will take VSI/SSB, as indicated by the main logit model. There appears, therefore, to be slightly more data to support the conclusion that quality Marines are not taking VSI/SSB at higher rates yet enough data exists which is inconsistent or contrary. This sheds doubt on any major conclusion which can be drawn on quality Marines, as defined in terms of an aggregation of variables. Conclusions can be drawn, as they have already, about individual quality variables. The problem exists when an attempt is made to combine the measurements on several variables as an overall definition of quality.

Jackofsky's hypothesis that job performance affects an individual's ease of movement, desirability of movement, and expectation of employer's action to fire, demote, or transfer, is not conclusively supported or refuted by this thesis [Ref. 6]. It is interesting that a direct performance measure derived from Marine Corps fitness reports yields statistically insignificant results. Again, it is important to point out that some quality factors influence a Marine's decision to take VSI/SSB; but once an overall quality definition is put together by an aggregating of several variables, results and conclusions become very fuzzy. If the Marine Corps is perceived as losing a higher proportion of quality people

because of VSI/SSB, it is not conclusively evident by this study.

2. Question 2

In response to the second unanswered question, concerning trends in the attribute profile of those taking VSI/SSB, there appears to be four major trends. Tenure, certain demographic characteristics, duty/job, and occupational field are all variables or attributes that appear to influence the choice behavior of Marines with respect to VSI/SSB.

There is strong evidence that suggests tenure has a significant effect on choice behavior, within the context of this study. Not only are age and grade significant from both a multivariate and bivariate perspective, but the magnitude of both effects are very large, particularly that of grade. It was surprising to see the E5 variable as statistically significant while the E7 variable was not. The E7 take-rate in FY92 was 6.66% less than average. Nevertheless, it appears reasonable that the more time one has spent in the Marine Corps, the less likely he/she is to take the exit bonus. E5s, within the VSI/SSB eligible population, on average had 10.58 years in service while E7s averaged 15.89 years. E7s have considerable time and effort invested in the organization. The Marine Corps "way of life" is probably deeply entrenched in a Marine with greater tenure. Job stability is also an important concern of such a Marine.

An E5, on the other hand, is young[6] and only has invested a few years in the organization. E5s may perceive they are still young enough and possess the newly acquired, military learned skills necessary to effectively enter the civilian labor market. The time-value of money is also much different between the older and younger Marines. Research has shown that younger Marines have a much higher discount rate and thus are prone to accept large stipends of money (bonuses) quickly [Ref. 27]. Regardless of the rationale, tenure seems to affect turnover behavior in a downsizing environment.

Secondly, two demographic variables identify two groups of people prone to either taking or not taking the VSI/SSB at higher rates with greater probabilities than average. Blacks and females are these two groups. Both have tendencies to take the VSI/SSB in opposite directions. Blacks tend to take the VSI/SSB at lower rates, while females tend to take the VSI/SSB at higher rates. Chapter V offered some speculative reasons why these trends occur. The heart of the issue seems to stem from some notion of discrimination, such as blacks not desiring to enter into a civilian labor market racked with wage and job discrimination or women not desiring to remain in an occupation literally dominated by males, enduring whatever level of gender discrimination may be perceived to exist.

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[6]E5s average age within the eligible VSI/SSB population was 30.23 years versus E7s average age of 35.63 years.

Thirdly, duty/job appears to influence a Marine's decision whether to take VSI/SSB or not. Once again, two types of duty yield different, yet significant, results. Those Marines on independent duty tend to take VSI/SSB, whereas those in school or assigned to school commands tend not to take. Summarizing the discussion in Chapter V, those military jobs connected to the civilian community, business, and influence seem prone to leaving the Marine Corps via the VSI/SSB program. Independent duty away from major Marine Corps establishments can be demanding and somewhat de-motivating when one is accustomed to being surrounded by fellow Marines with common problems and challenges. Commradarie and esprit de corps could be lacking in this duty environment. These are speculative reasons for the higher-than-average take-rates and probabilities among Marines on this particular type of duty.

On the other hand, jobs oriented toward motivating, teaching, learning, warfighting, and the many other assorted missions associated with school duty may have influenced a Marine's decision not to take VSI/SSB. Perceived opportunities, either through promotion or reassignment, may also have influenced the decision in the same direction. Regardless, the magnitude of effect of both variables is moderate in relation to the effects of the other variables.

Marines with technical occupational specialties tended to take VSI/SSB at higher rates and have a greater probability

to leave via VSI/SSB. This result has appeared in countless retention studies of first-termers. The magnitude of effect for the occupational field variables were relatively high. Again, this result is consistent with prior research. Selective reenlistment bonuses were designed to entice service members highly trained or trained through costly means to stay, resulting in lowered training costs and sustained organizational effectiveness. As with SRBs, the Marine Corps needs to monitor the targeted groups and goals for VSI/SSB carefully. In a multivariate world, the targeting of one particular group of people through an incentive program can ultimately spillover into another group of people. In this case, technical specialties have been targeted.

Overall, low tenured groups (E5s), Marines on independent duty, those in technical occupations, and possibly females have been targeted through the Marine Corps FY92 VSI/SSB voluntary separation incentive program.

C. WEAKNESSES OF THE STUDY

Because of the desire of the study to explore the relationships between quality variables, primarily PI, and the dependent variable (probability of taking VSI/SSB), the original eligible population was reduced to less than half. The Heckman procedure and the bivariate profile of all eligibles adequately compensated for this weakness; yet not having to perform such theoretical and technical statistical procedures might have offered clearer support in more

understandable terms. Future studies focusing on duty variables, tenure variables, or occupational-field variables should be able to dispense with these additional procedures.

Even though there were only 7% of overall takers not treated as such, because of administrative problems when formulating the data set, nevertheless some key data are omitted. It remains to be seen whether this omission would have affected the results in any significant way.

As in much of the previous research, survey data would be the ideal method of ascertaining relationships between quit behavior under pecuniary incentives and various behavioral factors. One very important point to remember is that in the current environment of budget austerity, costly ad hoc surveys probably will not be affordable data alternatives. Instead, pre-existing administrative data sets containing socioeconomic, demographic, and military background variables will be some of the only practical and affordable data available. This study has shown that significant results can be achieved through the use of such data.

D. RECOMMENDATIONS

The Marine Corps has targeted certain populations or groupings of Marines through the VSI/SSB program. Realizing its initial desire to force shape by reducing and eliminating MOSs tied to equipment phase-outs and to reduce promotion stagnation through increased attrition in certain MOSs, the Marine Corps may have stumbled into a spillover effect. It is

not the purpose of this thesis to evaluate the force shaping effectiveness of the current Marine Corps VSI/SSB policy, rather it is the purpose to assess what groups of Marines have been targeted by the VSI/SSB policy and to determine what particular variables affect a Marine's decision to take or not take VSI/SSB.

In order to determine a spillover effect, the Marine Corps first needs to assess the effectiveness of the VSI/SSB policy in terms of its accomplishments toward its force-shaping objectives. Results from this type of an assessment should be compared to the results of this study, whereby giving decision makers empirical evidence of the effectiveness and potential consequences of the policy. Since it is evident, through this study, that the Marine Corps has targeted a disproportionately high number of E5s through the VSI/SSB program, a question of concern arises, "How are we decreasing promotion stagnation when we discover E5s are taking the bonus at much higher-than-average rates and with much higher probabilities to do so?" Further study may assist in finding an answer.

Other groups such as those in technical occupational fields, females, Marines on independent or school duty, and blacks, have been significantly affected by the current policy, but not to the extent as E5s. This is an area which needs focus for future study, using FY93 data or aggregated FY92 and FY93 data. Differences between who is taking the VSI versus the SSB may be another way of determining whether

any modification of the current policy is necessary. One may find E5s almost exclusively taking the SSB. If E5s are not the focus of the Marine Corps' force shaping objectives, but rather E6s and E7s, then one may conclude that the VSI should be increased or "sweetened" to entice the more senior pay-grades. The 15-year retirement option may also be a viable strategy, pending its current legal review.

The Marine Corps currently holds exit surveys on many Marines recently discharged. The results of these surveys are invaluable in validating studies such as this one. Another recommendation would be to use the discharge survey data and determine why Marines decided to take the VSI/SSB and leave. A parallel study, using discharge survey data taken from Marines discharged before the inception of the VSI/SSB program, could be conducted to determine why Marines decided to leave under normal conditions. Comparisons between the two studies could be drawn to assess whether Marines have different reasons for taking VSI/SSB and leaving during conditions of downsizing versus leaving the Marine Corps under normal conditions.

Further study, using methodology similar to that used in this thesis, could focus upon specific MOSs, or specific types of duty categorized in greater detail. This study would provide deeper insights from different perspectives. This thesis attempted to focus upon quality, with inconclusive results. Instead, focused studies using variables found

statistically significant in this study, or variables found having higher/lower-than-average take-rates in FY92, may provide rich, invaluable insight into how better to modify or redesign current Marine Corps VSI/SSB voluntary-separation incentive policy. Further study may also determine that current policy (status quo) may be the "best" policy for today's Marine Corps.

APPENDIX A

MARINE CORPS FITNESS REPORT (1610)

This appendix contains the main portion of the Marine Corps fitness report format, sections A through D.

☆U.S. GOVERNMENT PRINTING OFFICE: 1988—540-410

USMC FITNESS REPORT (1610)
NAVMC 10835 (Rev 2 85)

ALIGNMENT LINE

SN 0000 00 006 3763 U/I PG of 100

REF MCO P1610 7__

SECTION A COMPLETED BY REPORTING SENIOR (USE OCR FONT TYPEWRITER ONLY)

PROGRAM DFR

1 ORGANIZATION a MCC b RUC c DESCRIPTIVE TITLE (Abbreviate as required)

2 MARINE REPORTED ON a LAST NAME b FIRST NAME c M I d GRADE e IDENTIFICATION NO f PMOS g STATUS

3 OCCASION AND PERIOD COVERED a OCC b PERIOD FROM TO c TYPE d PERIODS OF NONAVAILABILITY (30 or more consecutive days) EXPLAIN

4 DUTY ASSIGNMENT a DESCRIPTIVE TITLE b MONTHS c T O NO d LINE NO e DUMOS

5 SPECIAL INFORMATION a QUALIFICATION b REVIEWING OFFICER ID NO

6 RESERVED FOR FUTURE USE

7. RESERVED FOR FUTURE USE

8 ORGANIZED RESERVE DRILLS ATTN SKED

9 DEPENDENTS REQUIRING TRANSPORTATION a NO b LOCATION c ADDRESS

10a DUTY PREFERENCE (Code) 1st 2d 3d

10b DUTY PREFERENCE (Descriptive Title) (Abbreviate as required) 1st 2d 3d

11 REPORTING SENIOR a SERVICE b GRADE c IDENTIFICATION NO d NAME AND DUTY ASSIGNMENT

SECTION B COMPLETED BY REPORTING SENIOR USE BLACK INK AND FILL THE BOX TO INDICATE YOUR ESTIMATE OF THIS MARINE

12 SPECIAL CASE (Mark if applicable) NOT OBSERVED REPORT EXTENDED REPORT

13 PERFORMANCE

13a REGULAR DUTIES NO UN BA AV AA EX OS

13b ADDITIONAL DUTIES NO UN BA AV AA EX OS

13c ADMINISTRATIVE DUTIES NO UN BA AV AA EX OS

13d HANDLING OFFICERS (MARK NCOs NO) NO UN BA AV AA EX OS

13e HANDLING ENLISTED PERSONNEL NO UN BA AV AA EX OS

13f TRAINING PERSONNEL NO UN BA AV AA EX OS

13g TACTICAL HANDLING OF TROOPS NO UN BA AV AA EX OS

14 QUALITIES

14a ENDURANCE NO UN BA AV AA EX OS

14b PERSONAL APPEARANCE NO UN BA AV AA EX OS

14c MILITARY PRESENCE NO UN BA AV AA EX OS

14d ATTENTION TO DUTY NO UN BA AV AA EX OS

14e COOPERATION NO UN BA AV AA EX OS

14f INITIATIVE NO UN BA AV AA EX OS

14g JUDGMENT NO UN BA AV AA EX OS

14h PRESENCE OF MIND NO UN BA AV AA EX OS

14i FORCE NO UN BA AV AA EX OS

14j LEADERSHIP NO UN BA AV AA EX OS

14k LOYALTY NO UN BA AV AA EX OS

14l PERSONAL RELATIONS NO UN BA AV AA EX OS

14m ECONOMY OF MANAGEMENT NO UN BA AV AA EX OS

14n GROWTH POTENTIAL NO UN BA AV AA EX OS

15a YOUR ESTIMATE OF THIS MARINE'S GENERAL VALUE TO THE SERVICE NO UN BA AV AA EX OS

15b DISTRIBUTION OF MARKS FOR ALL MARINES OF THIS GRADE:

15c FILL BOXES SO THAT THE SUM OF EACH COLUMN CORRESPONDS TO ITEM 15b

1 1 1 1 1 1 1 1 1 1 1

2 2 2 2 2 2 2 2 2 2 2

4 4 4 4 4 4 4 4 4 4 4

8 8 8 8 8 8 8 8 8 8 8

16 CONSIDERING THE REQUIREMENTS OF SERVICE IN WAR INDICATE YOUR ATTITUDE TOWARD HAVING THIS MARINE UNDER YOUR COMMAND
NOT OBSERVED PREFER NOT BE WILLING BE GLAD PARTICULARLY DESIRE

17 HAS MARINE BEEN THE SUBJECT OF ANY OF THE FOLLOWING REPORTS? IF YES REFERENCE IN SECTION C
a COMMENDATORY YES NO b ADVERSE YES NO c DISCIPLINARY ACTION YES NO

18 REPORT BASED ON OBSERVATION DAILY FREQUENT INFREQUENT

19 QUALIFIED FOR PROMOTION NOT APPLICABLE YES NO

20 RECOMMENDATION FOR NEXT DUTY CONCUR (ITEM 10) 1 2 3 RECOMMEND A B C

21 RESERVED FOR FUTURE USE

CONSIDER THE MARINE REPORTED ON IN COMPARISON WITH ALL OTHERS WHOSE PROFESSIONAL ABILITIES ARE KNOWN TO YOU PERSONALLY

SECTION C

RECORD A CONCISE APPRAISAL OF THE PROFESSIONAL CHARACTER OF MARINE REPORTED ON. THIS SPACE MUST NOT BE LEFT BLANK

SECTION D SIGNATURES

22 I CERTIFY the information in section A is correct to the best of my knowledge

(Signature of Marine reported on) (Date)

23 I CERTIFY that to the best of my knowledge and belief all entries made hereon are true and without prejudice or partiality

(Signature of Reporting Senior) (Date)

24 (Check one when required) I HAVE SEEN THIS COMPLETED REPORT AND [ ] I HAVE NO STATEMENT TO MAKE [ ] I HAVE ATTACHED A STATEMENT

(Signature of Marine reported on) (Date)

25 REVIEWING OFFICER (Name, Grade, Service, Duty Assignment)

25a INITIALS

25b DATE

STAPLE ADDITIONAL PAGES HERE

APPENDIX B

LARGE SAMPLE FREQUENCIES

This appendix contains the initial frequencies of all major variables within the large sample of the data set used in this thesis.

DEPLTIME	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	5900	64.7	5900	64.7
1	496	5.4	6396	70.1
2	346	3.8	6742	73.9
3	362	4.0	7104	77.9
4	345	3.8	7449	81.7
5	238	2.6	7687	84.3
6	357	3.9	8044	88.2
7	320	3.5	8364	91.7
8	238	2.6	8602	94.3
9	194	2.1	8796	96.5
10	169	1.9	8965	98.3
11	127	1.4	9092	99.7
12	25	0.3	9117	100.0
21	1	0.0	9118	100.0

CAUC	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3311	36.3	3311	36.3
1	5807	63.7	9118	100.0

BLCK	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6405	70.2	6405	70.2
1	2713	29.8	9118	100.0

OTHR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8520	93.4	8520	93.4
1	598	6.6	9118	100.0

ADSPOUS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8591	94.2	8591	94.2
1	527	5.8	9118	100.0

BORNCITZ	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	824	9.0	824	9.0
1	8294	91.0	9118	100.0

DIVORC	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8330	91.4	8330	91.4
1	788	8.6	9118	100.0

MARRIED	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1419	15.6	1419	15.6
1	7699	84.4	9118	100.0

SINGL	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8487	93.1	8487	93.1
1	631	6.9	9118	100.0

NUMDEP	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	922	10.1	922	10.1
1	1291	14.2	2213	24.3
2	1884	20.7	4097	45.1
3	2772	30.5	6869	75.6
4	1494	16.4	8363	92.0
5	545	6.0	8908	98.0
6	124	1.4	9032	99.4
7	47	0.5	9079	99.9
8	10	0.1	9089	100.0
9	1	0.0	9090	100.0
10	1	0.0	9091	100.0

Frequency Missing = 27

DCTB_YRS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3728	42.3	3728	42.3
1	2246	25.5	5974	67.7
2	1639	18.6	7613	86.3
3	662	7.5	8275	93.8
4	229	2.6	8504	96.4
5	130	1.5	8634	97.9
6	59	0.7	8693	98.5
7	50	0.6	8743	99.1
8	27	0.3	8770	99.4
9	18	0.2	8788	99.6
10	11	0.1	8799	99.8
11	7	0.1	8906	99.8
12	7	0.1	8813	99.9
13	3	0.0	8816	99.9
14	2	0.0	8818	100.0
15	1	0.0	8819	100.0
16	2	0.0	8821	100.0

Frequency Missing = 297

AGE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
24	15	0.2	15	0.2
25	50	0.5	65	0.7
26	99	1.1	164	1.8
27	164	1.8	328	3.6
28	425	4.7	753	8.3
29	758	8.3	1511	16.6
30	994	10.9	2505	27.5
31	988	10.8	3493	38.3
32	961	10.5	4454	48.8
33	909	10.0	5363	58.8
34	921	10.1	6284	68.9
35	792	8.7	7076	77.6
36	634	7.0	7710	84.6
37	461	5.1	8171	89.6
38	325	3.6	8496	93.2
39	214	2.3	8710	95.5
40	144	1.6	8854	97.1
41	96	1.1	8950	98.2
42	63	0.7	9013	98.8
43	52	0.6	9065	99.4
44	28	0.3	9093	99.7
45	15	0.2	9108	99.9
46	8	0.1	9116	100.0
48	1	0.0	9117	100.0
50	1	0.0	9118	100.0

FULLDUTY	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	29	0.3	29	0.3
1	9089	99.7	9118	100.0

HSG	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	31	0.3	31	0.3
1	9087	99.7	9118	100.0

COLL	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8135	89.2	8135	89.2
1	983	10.8	9118	100.0

NHSG	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	9087	99.7	9097	99.7
1	31	0.3	9118	100.0

The SAS System 12:45

TIG	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	975	10.7	975	10.7
1	863	9.5	1838	20.2
2	1240	13.6	3078	33.8
3	1391	15.3	4469	49.0
4	1406	15.4	5875	64.4
5	1125	12.3	7000	76.8
6	755	8.3	7755	85.1
7	523	5.7	8278	90.8
8	341	3.7	8619	94.5
9	240	2.6	8859	97.2
10	160	1.8	9019	98.9
11	44	0.5	9063	99.4
12	32	0.4	9095	99.7
13	16	0.2	9111	99.9
14	6	0.1	9117	100.0
15	1	0.0	9118	100.0

YOS	Frequency	Percent	Cumuletive Frequency	Cumuletive Percent
6	57	0.6	57	0.6
7	115	1.3	172	1.9
8	212	2.3	384	4.2
9	336	3.7	720	7.9
10	765	8.4	1485	16.3
11	1406	15.4	2891	31.7
12	1159	12.7	4050	44.4
13	1065	11.7	5115	56.1
14	912	10.0	6027	66.1
15	875	9.6	6902	75.7
16	845	9.3	7747	85.0
17	605	6.6	8352	91.6
18	467	5.1	8819	96.7
19	299	3.3	9118	100.0

FEMALE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8679	95.2	8679	95.2
1	439	4.8	9118	100.0

SSBVSI	Frequency	Percent	Cumuletive Frequency	Cumuletive Percent
0	8187	89.8	8187	89.8
1	931	10.2	9118	100.0

ADMINSUP	Frequency	Percent	Cumulative Frequency	Cumuletive Percent
0	6726	73.8	6726	73.8
1	2392	26.2	9118	100.0

CMBTARMS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6295	69.0	6295	69.0
1	2823	31.0	9118	100.0

CSS_NT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8174	89.6	8174	89.6
1	944	10.4	9118	100.0

CSS_T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	7768	85.2	7768	85.2
1	1350	14.8	9118	100.0

GARSUP	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8510	93.3	8510	93.3
1	608	6.7	9118	100.0

ELECAVN	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8117	89.0	8117	89.0
1	1001	11.0	9118	100.0

SECUR_DU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8696	95.4	8696	95.4
1	422	4.6	9118	100.0

FMF_DU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4307	47.2	4307	47.2
1	4811	52.8	9118	100.0

NFMF_DU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	7397	81.1	7397	81.1
1	1721	18.9	9118	100.0

RCTG_DU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8586	94.2	8586	94.2
1	532	5.8	9118	100.0

INDEP_DU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8123	89.1	8123	89.1
1	995	10.9	9118	100.0

SCH_DU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8481	93.0	8481	93.0
1	637	7.0	9118	100.0

GTGCTTOT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
50	3	0.0	3	0.0
53	1	0.0	4	0.0
55	2	0.0	6	0.1
57	2	0.0	8	0.1
60	5	0.1	13	0.1
61	3	0.0	16	0.2
63	1	0.0	17	0.2
64	2	0.0	19	0.2
65	9	0.1	28	0.3
66	1	0.0	29	0.3
67	5	0.1	34	0.4
68	2	0.0	36	0.4
69	10	0.1	46	0.5
70	4	0.0	50	0.5
71	14	0.2	64	0.7
72	4	0.0	68	0.7
73	47	0.5	115	1.3
74	4	0.0	119	1.3
75	49	0.5	168	1.8
76	8	0.1	176	1.9
77	64	0.7	240	2.6
78	69	0.8	309	3.4
79	5	0.1	314	3.4
80	139	1.5	453	5.0
81	13	0.1	466	5.1
82	156	1.7	622	6.8
83	32	0.4	654	7.2
84	28	0.3	682	7.5
85	174	1.9	856	9.4
86	28	0.3	884	9.7
87	193	2.1	1077	11.8
88	54	0.6	1131	12.4
89	185	2.0	1316	14.4
90	59	0.6	1375	15.1
91	44	0.5	1419	15.6
92	290	3.2	1709	18.7
93	56	0.6	1765	19.4
94	250	2.7	2015	22.1
95	79	0.9	2094	23.0

GTGCTTOT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
96	247	2.7	2341	25.7
97	72	0.8	2413	26.5
98	295	3.2	2708	29.7
99	145	1.6	2853	31.3
100	310	3.4	3163	34.7
101	36	0.4	3199	35.1
102	311	3.4	3510	38.5
103	117	1.3	3627	39.8
104	239	2.6	3866	42.4
105	193	2.1	4059	44.5
106	305	3.3	4364	47.9
107	110	1.2	4474	49.1
108	252	2.8	4726	51.8
109	275	3.0	5001	54.8
110	118	1.3	5119	56.1
111	369	4.0	5488	60.2
112	279	3.1	5767	63.2
113	242	2.7	6009	65.9
114	207	2.3	6216	68.2
115	233	2.6	6449	70.7
116	276	3.0	6725	73.8
117	356	3.9	7081	77.7
118	62	0.7	7143	78.3
119	236	2.6	7379	80.9
120	103	1.1	7482	82.1
121	282	3.1	7764	85.2
122	75	0.8	7839	86.0
123	278	3.0	8117	89.0
124	118	1.3	8235	90.3
125	110	1.2	8345	91.5
126	176	1.9	8521	93.5
127	51	0.6	8572	94.0
128	62	0.7	8634	94.7
129	25	0.3	8659	95.0
130	121	1.3	8780	96.3
131	90	1.0	8870	97.3
132	29	0.3	8899	97.6
133	55	0.6	8954	98.2
134	6	0.1	8960	98.3
135	81	0.9	9041	99.2
136	35	0.4	9076	99.5
140	1	0.0	9077	99.6
143	12	0.1	9089	99.7
145	16	0.2	9105	99.9
147	1	0.0	9106	99.9
152	5	0.1	9111	99.9
155	6	0.1	9117	100.0
156	1	0.0	9118	100.0

The SAS System

PI	Frequency	Percent	Cumulative Frequency	Cumulative Percent
3.5	1	0.0	1	0.0
4.8	1	0.0	2	0.0
5	1	0.0	3	0.1
5.4	3	0.1	6	0.1
5.5	2	0.0	8	0.2
5.6	1	0.0	9	0.2
5.7	2	0.0	11	0.3
5.9	2	0.0	13	0.3
6	4	0.1	17	0.4
6.1	5	0.1	22	0.5
6.2	9	0.2	31	0.7
6.3	5	0.1	36	0.8
6.4	9	0.2	45	1.0
6.5	5	0.1	50	1.1
6.6	5	0.1	55	1.3
6.7	9	0.2	64	1.5
6.8	11	0.3	75	1.7
6.9	12	0.3	87	2.0
7	16	0.4	103	2.3
7.1	16	0.4	119	2.7
7.2	36	0.8	155	3.5
7.3	29	0.7	184	4.2
7.4	40	0.9	224	5.1
7.5	46	1.0	270	6.2
7.6	59	1.3	329	7.5
7.7	70	1.6	399	9.1
7.8	105	2.4	504	11.5
7.9	111	2.5	615	14.0
8	169	3.9	784	17.9
8.1	173	3.9	957	21.8
8.2	202	4.6	1159	26.4
8.3	269	6.1	1428	32.6
8.4	321	7.3	1749	39.9
8.5	345	7.9	2094	47.7
8.6	441	10.1	2535	57.8
8.7	477	10.9	3012	68.7
8.8	539	12.3	3551	80.9
8.9	507	11.6	4058	92.5
9	329	7.5	4387	100.0

Frequency Missing = 4731

DAUS_DR1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2254	24.7	2254	24.7
1	747	8.2	3001	32.9
2	797	8.7	3798	41.7
3	874	9.6	4672	51.2
4	734	8.1	5406	59.3
5	610	6.7	6016	66.0
6	555	6.1	6571	72.1
7	485	5.3	7056	77.4
8	410	4.5	7466	81.9
9	331	3.6	7797	85.5
10	257	2.8	8054	88.3
11	203	2.2	8257	90.6
12	157	1.7	8414	92.3
13	160	1.8	8574	94.0
14	153	1.7	8727	95.7
15	107	1.2	8834	96.9
16	98	1.1	8932	98.0
17	55	0.6	8987	98.6
18	49	0.5	9036	99.1
19	33	0.4	9069	99.5
20	24	0.3	9093	99.7
21	15	0.2	9108	99.9
22	8	0.1	9116	100.0
23	2	0.0	9118	100.0

ADD_PAY	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	7830	85.9	7830	85.9
1	3	0.0	7833	85.9
2	4	0.0	7837	86.0
2.2	106	1.2	7943	87.1
3	1	0.0	7944	87.1
4.4	151	1.7	8095	88.8
6	87	1.0	8182	89.7
6.6	380	4.2	8562	93.9
8.8	556	6.1	9118	100.0

REBONUS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2221	24.4	2221	24.4
1	6897	75.6	9118	100.0

INMOS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2388	26.2	2388	26.2
1	6730	73.8	9118	100.0

E5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	7484	82.1	7484	82.1
1	1634	17.9	9118	100.0

E6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4141	45.4	4141	45.4
1	4977	54.6	9118	100.0

E7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6611	72.5	6611	72.5
1	2507	27.5	9118	100.0

TT_EAS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	0.0	3	0.0
1	2	0.0	5	0.1
2	55	0.6	60	0.7
3	123	1.3	183	2.0
4	162	1.8	345	3.8
5	176	1.9	521	5.7
6	136	1.5	657	7.2
7	140	1.5	797	8.7
8	136	1.5	933	10.2
9	144	1.6	1077	11.8
10	198	2.2	1275	14.0
11	207	2.3	1482	16.3
12	212	2.3	1694	18.6
13	258	2.8	1952	21.4
14	221	2.4	2173	23.8
15	203	2.2	2376	26.1
16	214	2.3	2590	28.4
17	263	2.9	2853	31.3
18	147	1.6	3000	32.9
19	128	1.4	3128	34.3
20	192	2.1	3320	36.4
21	164	1.8	3484	38.2
22	188	2.1	3672	40.3
23	179	2.0	3851	42.2
24	222	2.4	4073	44.7
25	211	2.3	4284	47.0
26	208	2.3	4492	49.3
27	135	1.5	4627	50.7
28	141	1.5	4768	52.3
29	177	1.9	4945	54.2
30	122	1.3	5067	55.6
31	72	0.8	5139	56.4
32	85	0.9	5224	57.3
33	156	1.7	5380	59.0
34	145	1.6	5525	60.6
35	177	1.9	5702	62.5
36	170	1.9	5872	64.4
37	164	1.8	6036	66.2
38	139	1.5	6175	67.7
39	116	1.3	6291	69.0

The SAS System

TT_EAS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
40	119	1.3	6410	70.3
41	134	1.5	6544	71.8
42	79	0.9	6623	72.6
43	61	0.7	6684	73.3
44	66	0.7	6750	74.0
45	147	1.6	6897	75.6
46	130	1.4	7027	77.1
47	144	1.6	7171	78.6
48	106	1.2	7277	79.8
49	163	1.8	7440	81.6
50	157	1.7	7597	83.3
51	129	1.4	7726	84.7
52	84	0.9	7810	85.7
53	90	1.0	7900	86.6
54	92	1.0	7992	87.7
55	59	0.6	8051	88.3
56	36	0.4	8087	88.7
57	100	1.1	8187	89.8
58	68	0.7	8255	90.5
59	81	0.9	8336	91.4
60	66	0.7	8402	92.1
61	62	0.7	8464	92.8
62	87	1.0	8551	93.8
63	50	0.5	8601	94.3
64	59	0.6	8660	95.0
65	40	0.4	8700	95.4
66	38	0.4	8738	95.8
67	40	0.4	8778	96.3
68	29	0.3	8807	96.6
69	78	0.9	8885	97.4
70	60	0.7	8945	98.1
71	76	0.8	9021	98.9
72	38	0.4	9059	99.4
73	24	0.3	9083	99.6
74	28	0.3	9111	99.9
75	7	0.1	9118	100.0

TT_EASSQ	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	0.0	3	0.0
1	2	0.0	5	0.1
4	55	0.6	60	0.7
9	123	1.3	183	2.0
16	162	1.8	345	3.8
25	176	1.9	521	5.7
36	136	1.5	657	7.2
49	140	1.5	797	8.7
64	136	1.5	933	10.2
81	144	1.6	1077	11.8
100	198	2.2	1275	14.0
121	207	2.3	1482	16.3
144	212	2.3	1694	18.6
169	258	2.8	1952	21.4
196	221	2.4	2173	23.8
225	203	2.2	2376	26.1
256	214	2.3	2590	28.4
289	263	2.9	2853	31.3
324	147	1.6	3000	32.9
361	128	1.4	3128	34.3
400	192	2.1	3320	36.4
441	164	1.8	3484	38.2
484	188	2.1	3672	40.3
529	179	2.0	3851	42.2
576	222	2.4	4073	44.7
625	211	2.3	4284	47.0
676	208	2.3	4492	49.3
729	135	1.5	4627	50.7
784	141	1.5	4768	52.3
841	177	1.9	4945	54.2
900	122	1.3	5067	55.6
961	72	0.8	5139	56.4
1024	85	0.9	5224	57.3
1089	156	1.7	5380	59.0
1156	145	1.6	5525	60.6
1225	177	1.9	5702	62.5
1296	170	1.9	5872	64.4
1369	164	1.8	6036	66.2
1444	139	1.5	6175	67.7
1521	116	1.3	6291	69.0
1600	119	1.3	6410	70.3
1681	134	1.5	6544	71.8
1764	79	0.9	6623	72.6
1849	61	0.7	6684	73.3
1936	66	0.7	6750	74.0
2025	147	1.6	6897	75.6
2116	130	1.4	7027	77.1
2209	144	1.6	7171	78.6
2304	106	1.2	7277	79.8
2401	163	1.8	7440	81.6
2500	157	1.7	7597	83.3
2601	129	1.4	7726	84.7
2704	84	0.9	7810	85.7
2809	90	1.0	7900	86.6
2916	92	1.0	7992	87.7
3025	59	0.6	8051	88.3
3136	36	0.4	8087	88.7
3249	100	1.1	8187	89.8
3364	68	0.7	8255	90.5
3481	81	0.9	8336	91.4
3600	66	0.7	8402	92.1
3721	62	0.7	8464	92.8

TT_EASSQ	Frequency	Percent	Cumulative Frequency	Cumulative Percent
3844	87	1.0	8551	93.8
3969	50	0.5	8601	94.3
4096	59	0.6	8660	95.0
4225	40	0.4	8700	95.4
4356	38	0.4	8738	95.8
4489	40	0.4	8778	96.3
4624	29	0.3	8807	96.6
4761	78	0.9	8885	97.4
4900	60	0.7	8945	98.1
5041	76	0.8	9021	98.9
5184	38	0.4	9059	99.4
5329	24	0.3	9083	99.6
5476	28	0.3	9111	99.9
5625	7	0.1	9118	100.0

F_RCTRD1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6689	73.4	6689	73.4
1	2429	26.6	9118	100.0

GEOBACH	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6675	73.2	6675	73.2
1	2443	26.8	9118	100.0

PFTSCORE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	360	3.9	360	3.9
87	1	0.0	361	4.0
97	1	0.0	362	4.0
104	2	0.0	364	4.0
108	2	0.0	366	4.0
109	1	0.0	367	4.0
110	7	0.1	374	4.1
111	1	0.0	375	4.1
112	8	0.1	383	4.2
113	2	0.0	385	4.2
114	8	0.1	393	4.3
115	4	0.0	397	4.4
116	6	0.1	403	4.4
117	11	0.1	414	4.5
118	5	0.1	419	4.6
119	6	0.1	425	4.7
120	5	0.1	430	4.7
121	8	0.1	438	4.8
122	2	0.0	440	4.8
123	9	0.1	449	4.9
124	9	0.1	458	5.0
125	12	0.1	470	5.2
126	13	0.1	483	5.3
127	21	0.2	504	5.5
128	12	0.1	516	5.7
129	17	0.2	533	5.8
130	12	0.1	545	6.0

PFTSCORE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
131	13	0.1	558	6.1
132	16	0.2	574	6.3
133	8	0.1	582	6.4
134	11	0.1	593	6.5
135	17	0.2	610	6.7
136	16	0.2	626	6.9
137	16	0.2	642	7.0
138	9	0.1	651	7.1
139	26	0.3	677	7.4
140	18	0.2	695	7.6
141	22	0.2	717	7.9
142	28	0.3	745	8.2
143	21	0.2	766	8.4
144	15	0.2	781	8.6
145	33	0.4	814	8.9
146	25	0.3	839	9.2
147	17	0.2	856	9.4
148	21	0.2	877	9.6
149	25	0.3	902	9.9
150	33	0.4	935	10.3
151	25	0.3	960	10.5
152	25	0.3	985	10.8
153	31	0.3	1016	11.1
154	31	0.3	1047	11.5
155	26	0.3	1073	11.8
156	30	0.3	1103	12.1
157	36	0.4	1139	12.5
158	27	0.3	1166	12.8
159	23	0.3	1189	13.0
160	27	0.3	1216	13.3
161	30	0.3	1246	13.7
162	30	0.3	1276	14.0
163	23	0.3	1299	14.2
164	25	0.3	1324	14.5
165	46	0.5	1370	15.0
166	37	0.4	1407	15.4
167	20	0.2	1427	15.7
168	40	0.4	1467	16.1
169	28	0.3	1495	16.4
170	36	0.4	1531	16.8
171	31	0.3	1562	17.1
172	31	0.3	1593	17.5
173	35	0.4	1628	17.9
174	35	0.4	1663	18.2
175	45	0.5	1708	18.7
176	37	0.4	1745	19.1
177	29	0.3	1774	19.5
178	46	0.5	1820	20.0
179	32	0.4	1852	20.3
180	45	0.5	1897	20.8
181	42	0.5	1939	21.3
182	43	0.5	1982	21.7
183	31	0.3	2013	22.1
184	43	0.5	2056	22.5
185	36	0.4	2092	22.9
186	46	0.5	2138	23.4
187	35	0.4	2173	23.8
188	36	0.4	2209	24.2
189	40	0.4	2249	24.7
190	46	0.5	2295	25.2
191	42	0.5	2337	25.6
192	41	0.4	2378	26.1
193	37	0.4	2415	26.5

PETSCORE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
194	42	0.5	2457	26.9
195	41	0.4	2498	27.4
196	51	0.6	2549	28.0
197	32	0.4	2581	28.[illegible]
198	36	0.4	2617	28.7
199	42	0.5	2659	29.2
200	59	0.6	2718	29.8
201	49	0.5	2767	30.3
202	54	0.6	2821	30.9
203	60	0.7	2881	31.6
204	48	0.5	2929	32.1
205	51	0.6	2980	32.7
206	59	0.6	3039	33.3
207	50	0.5	3089	33.9
208	56	0.6	3145	34.5
209	60	0.7	3205	35.2
210	59	0.6	3264	35.8
211	56	0.6	3320	36.4
212	51	0.6	3371	37.0
213	61	0.7	3432	37.6
214	45	0.5	3477	38.1
215	52	0.6	3529	38.7
216	55	0.6	3584	39.3
217	67	0.7	3651	40.0
218	50	0.5	3701	40.6
219	50	0.5	3751	41.1
220	52	0.6	3803	41.7
221	53	0.6	3856	42.3
222	58	0.6	3914	42.9
223	66	0.7	3980	43.6
224	72	0.8	4052	44.4
225	73	0.8	4125	45.2
226	60	0.7	4185	45.9
227	76	0.8	4261	46.7
228	68	0.7	4329	47.5
229	46	0.5	4375	48.0
230	69	0.8	4444	48.7
231	54	0.6	4498	49.3
232	68	0.7	4566	50.1
233	62	0.7	4628	50.8
234	60	0.7	4688	51.4
235	64	0.7	4752	52.1
236	56	0.6	4808	52.7
237	70	0.8	4878	53.5
238	58	0.6	4936	54.1
239	43	0.5	4979	54.6
240	70	0.8	5049	55.4
241	61	0.7	5110	56.0
242	57	0.6	5167	56.7
243	70	0.8	5237	57.4
244	62	0.7	5299	58.1
245	72	0.8	5371	58.9
246	67	0.7	5438	59.6
247	64	0.7	5502	60.3
248	63	0.7	5565	61.0
249	67	0.7	5632	61.8
250	78	0.9	5710	62.6
251	59	0.6	5769	63.3
252	77	0.8	5846	64.1
253	78	0.9	5924	65.0
254	48	0.5	5972	65.5
255	76	0.8	6048	66.3
256	67	0.7	6115	67.1
257	64	0.7	6179	67.8

The SAS System

PFTSCORE	Frequency	Percent	Cumuletive Frequency	Cumulative Percent
258	70	0.8	6249	68.5
259	65	0.7	6314	69.2
260	67	0.7	6381	70.0
261	61	0.7	6442	70.7
262	81	0.9	6523	71.5
263	80	0.9	6603	72.4
264	75	0.8	6678	73.2
265	69	0.8	6747	74.0
266	64	0.7	6811	74.7
267	78	0.9	6889	75.6
268	69	0.8	6958	76.3
269	66	0.7	7024	77.0
270	94	1.0	7118	78.1
271	67	0.7	7185	78.8
272	73	0.8	7258	79.6
273	81	0.9	7339	80.5
274	82	0.9	7421	81.4
275	75	0.8	7496	82.2
276	80	0.9	7576	83.1
277	77	0.8	7653	83.9
278	65	0.7	7718	84.6
279	92	1.0	7810	85.7
280	61	0.7	7871	86.3
281	77	0.8	7948	87.2
282	74	0.8	8022	88.0
283	70	0.8	8092	88.7
284	71	0.8	8163	89.5
285	106	1.2	8269	90.7
286	68	0.7	8337	91.4
287	73	0.8	8410	92.2
288	56	0.6	8466	92.8
289	68	0.7	8534	93.6
290	65	0.7	8599	94.3
291	61	0.7	8660	95.0
292	61	0.7	8721	95.6
293	45	0.5	8766	96.1
294	41	0.4	8807	96.6
295	31	0.3	8838	96.9
296	48	0.5	8886	97.5
297	34	0.4	8920	97.8
298	26	0.3	8946	98.1
299	17	0.2	8963	98.3
300	155	1.7	9118	100.0

ADDMOS	Frequency	Percent	Cumuletive Frequency	Cumuletive Percent
0	4193	46.0	4193	46.0
1	4925	54.0	9118	100.0

CONT_EXP	Frequency	Percent	Cumuletive Frequency	Cumuletive Percent
0	8859	97.2	8859	97.2
1	259	2.8	9118	100.0

P1_M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4731	51.9	4731	51.9
1	4397	48.1	9118	100.0

NREBONUS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6897	75.6	6897	75.6
1	2221	24.4	9118	100.0

NBORNCIT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8294	91.0	8294	91.0
1	824	9.0	9118	100.0

N_1NMOS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6730	73.8	6730	73.8
1	2388	26.2	9118	100.0

N_ADDMOS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4925	54.0	4925	54.0
1	4193	46.0	9118	100.0

NODUTY	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	9089	99.7	9089	99.7
1	29	0.3	9118	100.0

APPENDIX C

SMALL SAMPLE FREQUENCIES

This appendix contains all the frequencies of the smaller sample. This sample was derived from the larger or original sample. Observations in this sample were selected out based upon the PI variable. Those observations not having the PI variable have been removed.

DEPLTIME	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2740	62.5	2740	62.5
1	258	5.9	2998	68.3
2	168	3.8	3166	72.2
3	172	3.9	3339	76.1
4	156	3.6	3494	79.6
5	136	3.1	3630	82.7
6	188	4.3	3818	87.0
7	174	4.0	3992	91.0
8	118	2.7	4110	93.7
9	96	2.2	4206	95.9
10	89	2.0	4295	97.9
11	79	1.8	4374	99.7
12	12	0.3	4386	100.0
21	1	0.0	4387	100.0

CAUC	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1532	34.9	1532	34.9
1	2855	65.1	4387	100.0

BLCK	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3143	71.6	3143	71.6
1	1244	28.4	4387	100.0

OTHR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4099	93.4	4099	93.4
1	288	6.6	4387	100.0

ADSPOUS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4129	94.1	4129	94.1
1	258	5.9	4387	100.0

BORNCITZ	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	391	8.9	391	8.9
1	3996	91.1	4387	100.0

The SAS System

DIVORC	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4006	91.3	4006	91.3
1	381	8.7	4387	100.0

MARRIED	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	671	15.3	671	15.3
1	3716	84.7	4387	100.0

SINGL	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4097	93.4	4097	93.4
1	290	6.6	4387	100.0

NUMDEP	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	425	9.7	425	9.7
1	612	14.0	1037	23.7
2	926	21.2	1963	44.9
3	1341	30.7	3304	75.6
4	712	16.3	4016	91.9
5	265	6.1	4281	97.9
6	64	1.5	4345	99.4
7	19	0.4	4364	99.8
8	6	0.1	4370	100.0
10	1	0.0	4371	100.0

Frequency Missing = 16

DCTB_YRS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1763	41.5	1763	41.5
1	1055	24.8	2818	66.3
2	776	18.3	3594	84.6
3	345	8.1	3939	92.7
4	120	2.8	4059	95.6
5	82	1.9	4141	97.5
6	28	0.7	4169	98.1
7	35	0.8	4204	99.0
8	16	0.4	4220	99.3
9	8	0.2	4228	99.5
10	8	0.2	4236	99.7
11	5	0.1	4241	99.8
12	3	0.1	4244	99.9
13	1	0.0	4245	99.9
14	1	0.0	4246	100.0
15	1	0.0	4247	100.0
16	1	0.0	4248	100.0

Frequency Missing = 139

The SAS System

AGE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
24	11	0.3	11	0.3
25	30	0.7	41	0.9
26	51	1.2	92	2.1
27	78	1.8	170	3.9
28	208	4.7	378	8.6
29	403	9.2	781	17.8
30	481	11.0	1262	28.8
31	413	9.4	1675	38.2
32	411	9.4	2086	47.5
33	385	8.8	2471	56.3
34	445	10.1	2916	66.5
35	393	9.0	3309	75.4
36	322	7.3	3631	82.8
37	248	5.7	3879	88.4
38	173	3.9	4052	92.4
39	116	2.6	4168	95.0
40	75	1.7	4243	96.7
41	55	1.3	4298	98.0
42	31	0.7	4329	98.7
43	31	0.7	4360	99.4
44	14	0.3	4374	99.7
45	8	0.2	4382	99.9
46	4	0.1	4386	100.0
50	1	0.0	4387	100.0

FULLDUTY	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	16	0.4	16	0.4
1	4371	99.6	4387	100.0

HSG	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	16	0.4	16	0.4
1	4371	99.6	4387	100.0

COLL	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3970	90.5	3970	90.5
1	417	9.5	4387	100.0

NHSG	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4371	99.6	4371	99.6
1	16	0.4	4387	100.0

TIG	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	290	6.6	290	6.6
1	410	9.3	700	16.0
2	569	13.0	1269	28.9
3	692	15.8	1961	44.7
4	726	16.5	2687	61.2
5	648	14.8	3335	76.0
6	431	9.8	3766	85.8
7	250	5.7	4016	91.5
8	178	4.1	4194	95.6
9	108	2.5	4302	98.1
10	48	1.1	4350	99.2
11	16	0.4	4366	99.5
12	13	0.3	4379	99.8
13	5	0.1	4384	99.9
14	2	0.0	4386	100.0
15	1	0.0	4387	100.0

YOS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
6	36	0.8	36	0.8
7	71	1.6	107	2.4
8	95	2.2	202	4.6
9	120	2.7	322	7.3
10	353	8.0	675	15.4
11	795	18.1	1470	33.5
12	502	11.4	1972	45.0
13	389	8.9	2361	53.8
14	377	8.6	2738	62.4
15	400	9.1	3138	71.5
16	460	10.5	3598	82.0
17	333	7.6	3931	89.6
18	285	6.5	4216	96.1
19	171	3.9	4387	100.0

FEMALE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4200	95.7	4200	95.7
1	187	4.3	4387	100.0

SSBVSI	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3854	87.9	3854	87.9
1	533	12.1	4387	100.0

ADMINSUP	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3273	74.6	3273	74.6
1	1114	25.4	4387	100.0

The SAS System 1

CMBTARMS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3132	71.4	3132	71.4
1	1255	28.6	4387	100.0

CSS_NT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3855	87.9	3855	87.9
1	532	12.1	4387	100.0

CSS_T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3692	84.2	3692	84.2
1	695	15.8	4387	100.0

GARSUP	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4124	94.0	4124	94.0
1	263	6.0	4387	100.0

ELECAVN	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3859	88.0	3859	88.0
1	528	12.0	4387	100.0

SECUR_DU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4179	95.3	4179	95.3
1	208	4.7	4387	100.0

FMF_DU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2013	45.9	2013	45.9
1	2374	54.1	4387	100.0

The SAS System

NFMF_DU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3612	82.3	3612	82.3
1	775	17.7	4387	100.0

RCTG_DU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4148	94.6	4148	94.6
1	239	5.4	4387	100.0

INDEP_DU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3883	88.5	3883	88.5
1	504	11.5	4387	100.0

SCH_DU	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4100	93.5	4100	93.5
1	287	6.5	4387	100.0

GTGCTTOT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
53	1	0.0	1	0.0
55	2	0.0	3	0.1
57	1	0.0	4	0.1
60	2	0.0	6	0.1
65	2	0.0	8	0.2
66	1	0.0	9	0.2
67	3	0.1	12	0.3
68	1	0.0	13	0.3
69	3	0.1	16	0.4
70	3	0.1	19	0.4
71	6	0.1	25	0.6
73	21	0.5	46	1.0
74	2	0.0	48	1.1
75	25	0.6	73	1.7
76	4	0.1	77	1.8
77	32	0.7	109	2.5
78	32	0.7	141	3.2
79	4	0.1	145	3.3
80	70	1.6	215	4.9
81	5	0.1	220	5.0
82	72	1.6	292	6.7
83	14	0.3	306	7.0
84	15	0.3	321	7.3
85	86	2.0	407	9.3
86	16	0.4	423	9.6
87	95	2.2	518	11.8
88	28	0.6	546	12.4
89	89	2.0	635	14.5
90	31	0.7	666	15.2
91	23	0.5	689	15.7
92	134	3.1	823	18.8
93	37	0.8	860	19.6

The SAS System

GTGCTTOT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
94	121	2.8	981	22.4
95	37	0.8	1018	23.2
96	114	2.6	1132	25.8
97	35	0.8	1167	26.6
98	136	3.1	1303	29.7
99	73	1.7	1376	31.4
100	156	3.6	1532	34.9
101	15	0.3	1547	35.3
102	131	3.0	1678	38.2
103	73	1.7	1751	39.9
104	116	2.6	1867	42.6
105	94	2.1	1961	44.7
106	151	3.4	2112	48.1
107	54	1.2	2166	49.4
108	111	2.5	2277	51.9
109	132	3.0	2409	54.9
110	58	1.3	2467	56.2
111	177	4.0	2644	60.3
112	140	3.2	2784	63.5
113	110	2.5	2894	66.0
114	93	2.1	2987	68.1
115	124	2.8	3111	70.9
116	134	3.1	3245	74.0
117	169	3.9	3414	77.8
118	36	0.8	3450	78.6
119	108	2.5	3558	81.1
120	48	1.1	3606	82.2
121	134	3.1	3740	85.3
122	38	0.9	3778	86.1
123	136	3.1	3914	89.2
124	54	1.2	3968	90.4
125	50	1.1	4018	91.6
126	77	1.8	4095	93.3
127	21	0.5	4116	93.8
128	25	0.6	4141	94.4
129	11	0.3	4152	94.6
130	62	1.4	4214	96.1
131	48	1.1	4262	97.2
132	16	0.4	4278	97.5
133	33	0.8	4311	98.3
134	2	0.0	4313	98.3
135	35	0.8	4348	99.1
136	17	0.4	4365	99.5
143	6	0.1	4371	99.6
145	8	0.2	4379	99.8
147	1	0.0	4380	99.8
152	4	0.1	4384	99.9
155	3	0.1	4387	100.0

The SAS System 1

P1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
3.5	1	0.0	1	0.0
4.8	1	0.0	2	0.0
5	1	0.0	3	0.1
5.4	3	0.1	6	0.1
5.5	2	0.0	8	0.2
5.6	1	0.0	9	0.2
5.7	2	0.0	11	0.3
5.9	2	0.0	13	0.3
6	4	0.1	17	0.4
6.1	5	0.1	22	0.5
6.2	9	0.2	31	0.7
6.3	5	0.1	36	0.8
6.4	9	0.2	45	1.0
6.5	5	0.1	50	1.1
6.6	5	0.1	55	1.3
6.7	9	0.2	64	1.5
6.8	11	0.3	75	1.7
6.9	12	0.3	87	2.0
7	16	0.4	103	2.3
7.1	16	0.4	119	2.7
7.2	36	0.8	155	3.5
7.3	29	0.7	184	4.2
7.4	40	0.9	224	5.1
7.5	46	1.0	270	6.2
7.6	59	1.3	329	7.5
7.7	70	1.6	399	9.1
7.8	105	2.4	504	11.5
7.9	111	2.5	615	14.0
8	169	3.9	784	17.9
8.1	173	3.9	957	21.8
8.2	202	4.6	1159	26.4
8.3	269	6.1	1428	32.6
8.4	321	7.3	1749	39.9
8.5	345	7.9	2094	47.7
8.6	441	10.1	2535	57.8
8.7	477	10.9	3012	68.7
8.8	539	12.3	3551	80.9
8.9	507	11.6	4058	92.5
9	329	7.5	4387	100.0

DAUS_DR1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1123	25.6	1123	25.6
1	347	7.9	1470	33.5
2	382	8.7	1852	42.2
3	392	8.9	2244	51.2
4	358	8.2	2602	59.3
5	295	6.7	2897	66.0
6	258	5.9	3155	71.9
7	231	5.3	3386	77.2
8	187	4.3	3573	81.4
9	177	4.0	3750	85.5
10	127	2.9	3877	88.4
11	107	2.4	3984	90.8
12	76	1.7	4060	92.5
13	83	1.9	4143	94.4
14	74	1.7	4217	96.1
15	52	1.2	4269	97.3
16	44	1.0	4313	98.3
17	27	0.6	4340	98.9
18	17	0.4	4357	99.3
19	11	0.3	4368	99.6
20	9	0.2	4377	99.8
21	8	0.2	4385	100.0
22	1	0.0	4386	100.0
23	1	0.0	4387	100.0

ADD_PAY	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3799	86.6	3799	86.6
2	1	0.0	3800	86.6
2.2	53	1.2	3853	87.8
3	1	0.0	3854	87.9
4.4	73	1.7	3927	89.5
6	31	0.7	3958	90.2
6.6	174	4.0	4132	94.2
8.8	255	5.8	4387	100.0

REBONUS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1122	25.6	1122	25.6
1	3265	74.4	4387	100.0

INMOS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1060	24.2	1060	24.2
1	3327	75.8	4387	100.0

The SAS System

E5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3108	70.8	3108	70.8
1	1279	29.2	4387	100.0

E6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2806	64.0	2806	64.0
1	1581	36.0	4387	100.0

E7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2860	65.2	2860	65.2
1	1527	34.8	4387	100.0

TT_EAS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.0	1	0.0
1	2	0.0	3	0.1
2	32	0.7	35	0.8
3	81	1.8	116	2.6
4	92	2.1	208	4.7
5	106	2.4	314	7.2
6	75	1.7	389	8.9
7	64	1.5	453	10.3
8	70	1.6	523	11.9
9	81	1.8	604	13.8
10	114	2.6	718	16.4
11	121	2.8	839	19.1
12	114	2.6	953	21.7
13	140	3.2	1093	24.9
14	119	2.7	1212	27.6
15	105	2.4	1317	30.0
16	122	2.8	1439	32.8
17	144	3.3	1583	36.1
18	84	1.9	1667	38.0
19	59	1.3	1726	39.3
20	97	2.2	1823	41.6
21	86	2.0	1909	43.5
22	106	2.4	2015	45.9
23	81	1.8	2096	47.8
24	98	2.2	2194	50.0
25	107	2.4	2301	52.5
26	106	2.4	2407	54.9
27	60	1.4	2467	56.2
28	65	1.5	2532	57.7
29	91	2.1	2623	59.8
30	47	1.1	2670	60.9
31	36	0.8	2706	61.7
32	38	0.9	2744	62.5
33	72	1.6	2816	64.2
34	79	1.8	2895	66.0
35	66	1.5	2961	67.5
36	77	1.8	3038	69.3
37	73	1.7	3111	70.9
38	66	1.5	3177	72.4
39	51	1.2	3228	73.6
40	51	1.2	3279	74.7
41	68	1.6	3347	76.3

The SAS System

TT_EAS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
42	35	0.8	3382	77.1
43	34	0.8	3416	77.9
44	33	0.8	3449	78.6
45	67	1.5	3516	80.1
46	45	1.0	3561	81.2
47	72	1.6	3633	82.8
48	44	1.0	3677	83.8
49	61	1.4	3738	85.2
50	56	1.3	3794	86.5
51	46	1.0	3840	87.5
52	33	0.8	3873	88.3
53	42	1.0	3915	89.2
54	37	0.8	3952	90.1
55	19	0.4	3971	90.5
56	15	0.3	3986	90.9
57	47	1.1	4033	91.9
58	26	0.6	4059	92.5
59	36	0.8	4095	93.3
60	25	0.6	4120	93.9
61	23	0.5	4143	94.4
62	30	0.7	4173	95.1
63	15	0.3	4188	95.5
64	23	0.5	4211	96.0
65	14	0.3	4225	96.3
66	13	0.3	4238	96.6
67	12	0.3	4250	96.9
68	19	0.4	4269	97.3
69	32	0.7	4301	98.0
70	25	0.6	4326	98.6
71	33	0.8	4359	99.4
72	11	0.3	4370	99.6
73	9	0.2	4379	99.8
74	8	0.2	4387	100.0

TT_EASSQ	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.0	1	0.0
1	2	0.0	3	0.1
4	32	0.7	35	0.8
9	81	1.8	116	2.6
16	92	2.1	208	4.7
25	106	2.4	314	7.2
36	75	1.7	389	8.9
49	64	1.5	453	10.3
64	70	1.6	523	11.9
81	81	1.8	604	13.8
100	114	2.6	718	16.4
121	121	2.8	839	19.1
144	114	2.6	953	21.7
169	140	3.2	1093	24.9
196	119	2.7	1212	27.6
225	105	2.4	1317	30.0
256	122	2.8	1439	32.8
289	144	3.3	1583	36.1
324	84	1.9	1667	38.0
361	59	1.3	1726	39.3
400	97	2.2	1823	41.6
441	86	2.0	1909	43.5
484	106	2.4	2015	45.9
529	81	1.8	2096	47.8
576	98	2.2	2194	50.0
625	107	2.4	2301	52.5
676	106	2.4	2407	54.9

The SAS System

TT_EASSQ	Frequency	Percent	Cumulative Frequency	Cumulative Percent
729	60	1.4	2467	56.2
784	65	1.5	2532	57.7
841	91	2.1	2623	59.8
900	47	1.1	2670	60.9
961	36	0.8	2706	61.7
1024	38	0.9	2744	62.5
1089	72	1.6	2816	64.2
1156	79	1.8	2895	66.0
1225	66	1.5	2961	67.5
1296	77	1.8	3038	69.3
1369	73	1.7	3111	70.9
1444	66	1.5	3177	72.4
1521	51	1.2	3228	73.6
1600	51	1.2	3279	74.7
1681	68	1.6	3347	76.3
1764	35	0.8	3382	77.1
1849	34	0.8	3416	77.9
1936	33	0.8	3449	78.6
2025	67	1.5	3516	80.1
2116	45	1.0	3561	81.2
2209	72	1.6	3633	82.8
2304	44	1.0	3677	83.8
2401	61	1.4	3738	85.2
2500	56	1.3	3794	86 5
2601	46	1.0	3840	87.5
2704	33	0.8	3873	88.3
2809	42	1.0	3915	89.2
2916	37	0.8	3952	90.1
3025	19	0.4	3971	90.5
3136	15	0.3	3986	90.9
3249	47	1.1	4033	91.9
3364	26	0.6	4059	92.5
3481	36	0.8	4095	93.3
3600	25	0.6	4120	93.9
3721	23	0.5	4143	94.4
3844	30	0.7	4173	95.1
3969	15	0.3	4188	95.5
4096	23	0.5	4211	96.0
4225	14	0.3	4225	96.3
4356	13	0.3	4238	96.6
4489	12	0.3	4250	96.9
4624	19	0.4	4269	97.3
4761	32	0.7	4301	98.0
4900	25	0.6	4326	98.6
5041	33	0.8	4359	99.4
5184	11	0.3	4370	99.6
5329	9	0.2	4379	99.8
5476	8	0.2	4387	100.0

F_RCTRDI	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3234	73.7	3234	73.7
1	1153	26.3	4387	100.0

GEOBACH	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3213	73.2	3213	73.2
1	1174	26.8	4387	100.0

PFTSCORE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	190	4.3	190	4.3
97	1	0.0	191	4.4
104	1	0.0	192	4.4
109	1	0.0	193	4.4
110	5	0.1	198	4.5
112	4	0.1	202	4.6
114	4	0.1	206	4.7
116	3	0.1	209	4.8
117	8	0.2	217	4.9
118	1	0.0	218	5.0
119	2	0.0	220	5.0
120	2	0.0	222	5.1
121	3	0.1	225	5.1
122	1	0.0	226	5.2
123	5	0.1	231	5.3
124	5	0.1	236	5.4
125	5	0.1	241	5.5
126	7	0.2	248	5.7
127	10	0.2	258	5.9
128	7	0.2	265	6.0
129	12	0.3	277	6.3
130	5	0.1	282	6.4
131	8	0.2	290	6.6
132	9	0.2	299	6.8
133	5	0.1	304	6.9
134	8	0.2	312	7.1
135	9	0.2	321	7.3
136	7	0.2	328	7.5
137	10	0.2	338	7.7
138	6	0.1	344	7.8
139	14	0.3	358	8.2
140	11	0.3	369	8.4
141	13	0.3	382	8.7
142	12	0.3	394	9.0
143	10	0.2	404	9.2
144	9	0.2	413	9.4
145	18	0.4	431	9.8
146	14	0.3	445	10.1
147	8	0.2	453	10.3
148	10	0.2	463	10.6
149	18	0.4	481	11.0
150	17	0.4	498	11.4
151	17	0.4	515	11.7
152	14	0.3	529	12.1
153	11	0.3	540	12.3
154	20	0.5	560	12.8
155	14	0.3	574	13.1
156	17	0.4	591	13.5
157	22	0.5	613	14.0
158	18	0.4	631	14.4
159	13	0.3	644	14.7
160	15	0.3	659	15.0
161	17	0.4	676	15.4
162	17	0.4	693	15.8
163	12	0.3	705	16.1
164	10	0.2	715	16.3
165	27	0.6	742	16.9
166	15	0.3	757	17.3
167	8	0.2	765	17.4
168	23	0.5	788	18.0
169	17	0.4	805	18.3
170	17	0.4	822	18.7
171	14	0.3	836	19.1

PFTSCORE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
172	15	0.3	851	19.4
173	15	0.3	866	19.7
174	11	0.3	877	20.0
175	24	0.5	901	20.5
176	15	0.3	916	20.9
177	13	0.3	929	21.2
178	19	0.4	948	21.6
179	16	0.4	964	22.0
180	24	0.5	988	22.5
181	24	0.5	1012	23.1
182	17	0.4	1029	23.5
183	12	0.3	1041	23.7
184	20	0.5	1061	24.2
185	12	0.3	1073	24.5
186	24	0.5	1097	25.0
187	16	0.4	1113	25.4
188	14	0.3	1127	25.7
189	20	0.5	1147	26.1
190	27	0.6	1174	26.8
191	16	0.4	1190	27.1
192	21	0.5	1211	27.6
193	13	0.3	1224	27.9
194	25	0.6	1249	28.5
195	14	0.3	1263	28.8
196	22	0.5	1285	29.3
197	17	0.4	1302	29.7
198	18	0.4	1320	30.1
199	19	0.4	1339	30.5
200	33	0.8	1372	31.3
201	25	0.6	1397	31.8
202	28	0.6	1425	32.5
203	29	0.7	1454	33.1
204	20	0.5	1474	33.6
205	25	0.6	1499	34.2
206	31	0.7	1530	34.9
207	24	0.5	1554	35.4
208	25	0.6	1579	36.0
209	26	0.6	1605	36.6
210	31	0.7	1636	37.3
211	29	0.7	1665	38.0
212	26	0.6	1691	38.5
213	33	0.8	1724	39.3
214	18	0.4	1742	39.7
215	24	0.5	1766	40.3
216	27	0.6	1793	40.9
217	41	0.9	1834	41.8
218	25	0.6	1859	42.4
219	28	0.6	1887	43.0
220	24	0.5	1911	43.6
221	25	0.6	1936	44.1
222	31	0.7	1967	44.8
223	41	0.9	2008	45.8
224	26	0.6	2034	46.4
225	36	0.8	2070	47.2
226	28	0.6	2098	47.8
227	36	0.8	2134	48.6
228	35	0.8	2169	49.4
229	20	0.5	2189	49.9
230	27	0.6	2216	50.5
231	26	0.6	2242	51.1
232	33	0.8	2275	51.9
233	30	0.7	2305	52.5
234	26	0.6	2331	53.1
235	31	0.7	2362	53.8

The SAS System

PFTSCORE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
236	33	0.8	2395	54.6
237	35	0.8	2430	55.4
238	28	0.6	2458	56.0
239	29	0.7	2487	56.7
240	38	0.9	2525	57.6
241	35	0.8	2560	58.4
242	26	0.6	2586	58.9
243	29	0.7	2615	59.6
244	31	0.7	2646	60.3
245	32	0.7	2678	61.0
246	33	0.8	2711	61.8
247	31	0.7	2742	62.5
248	32	0.7	2774	63.2
249	37	0.8	2811	64.1
250	37	0.8	2848	64.9
251	26	0.6	2874	65.5
252	37	0.8	2911	66.4
253	37	0.8	2948	67.2
254	21	0.5	2969	67.7
255	36	0.8	3005	68.5
256	35	0.8	3040	69.3
257	31	0.7	3071	70.0
258	31	0.7	3102	70.7
259	34	0.8	3136	71.5
260	34	0.8	3170	72.3
261	29	0.7	3199	72.9
262	37	0.8	3236	73.8
263	32	0.7	3268	74.5
264	31	0.7	3299	75.2
265	35	0.8	3334	76.0
266	26	0.6	3360	76.6
267	39	0.9	3399	77.5
268	31	0.7	3430	78.2
269	28	0.6	3458	78.8
270	48	1.1	3506	79.9
271	29	0.7	3535	80.6
272	33	0.8	3568	81.3
273	41	0.9	3609	82.3
274	35	0.8	3644	83.1
275	39	0.9	3683	84.0
276	43	1.0	3726	84.9
277	31	0.7	3757	85.6
278	29	0.7	3786	86.3
279	43	1.0	3829	87.3
280	27	0.6	3856	87.9
281	34	0.8	3890	88.7
282	34	0.8	3924	89.4
283	26	0.6	3950	90.0
284	26	0.6	3976	90.6
285	42	1.0	4018	91.6
286	29	0.7	4047	92.2
287	31	0.7	4078	93.0
288	33	0.8	4111	93.7
289	26	0.6	4137	94.3
290	26	0.6	4163	94.9
291	29	0.7	4192	95.6
292	30	0.7	4222	96.2
293	17	0.4	4239	96.6
294	14	0.3	4253	96.9
295	11	0.3	4264	97.2
296	22	0.5	4286	97.7
297	21	0.5	4307	98.2
298	12	0.3	4319	98.4
299	7	0.2	4326	98.6
300	61	1.4	4387	100.0

The SAS System

ADDMOS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2077	47.3	2077	47.3
1	2310	52.7	4387	100.0

CONT_EXP	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4227	96.4	4227	96.4
1	160	3.6	4387	100.0

PI_M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	4387	100.0	4387	100.0

NREBONUS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3265	74.4	3265	74.4
1	1122	25.6	4387	100.0

NBORNCIT	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3996	91.1	3996	91.1
1	391	8.9	4387	100.0

N_INMOS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3327	75.8	3327	75.8
1	1060	24.2	4387	100.0

N_ADDMOS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2310	52.7	2310	52.7
1	2077	47.3	4387	100.0

NODUTY	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4371	99.6	4371	99.6
1	16	0.4	4387	100.0

APPENDIX D

RESULTS OF LINEAR PROBABILITY OLS REGRESSION MODELS

This appendix contains the results of four linear probability OLS regression models used to detect multi-collinearity within a multivariate model. Variance inflation factors were used and are displayed. These results check the variables to be used in both the Heckman model and the Main model for collinearity.

Model: MODEL1
Dependent Variable: PI_M

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob > F
Model	23	326.88469	14.21238	66.667	0.0001
Error	8797	1875.37175	0.21318		
C Total	8820	2202.25643			

Root MSE	0.46172	R-square	0.1484
Dep Mean	0.48158	Adj R-sq	0.1462
C.V.	95.87595		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Variance Inflation
INTERCEP	1	0.187220	0.07095274	2.639	0.0083	0.00000000
NODUTY	1	-0.011298	0.08917972	-0.127	0.8992	1.00418069
NHSG	1	0.017665	0.08607279	0.205	0.8374	1.00449278
COLL	1	-0.048812	0.01658111	-2.944	0.0033	1.10534802
F_RCTRDI	1	0.038402	0.01469665	2.613	0.0090	1.74332857
PFTSCORE	1	-0.000003427	0.00008373	-0.041	0.9674	1.17418210
AOOMOS	1	-0.033498	0.01196190	-2.800	0.0051	1.47020480
DEPLTIME	1	0.001938	0.00171118	1.132	0.2575	1.11172053
DCTB_YRS	1	0.002426	0.00329039	0.737	0.4609	1.08802313
DAUS_DR1	1	-0.001121	0.00110916	-1.011	0.3122	1.06666552
GEOBACH	1	-0.009846	0.01166246	-0.844	0.3985	1.09998983
BLCK	1	-0.026524	0.01116098	-2.376	0.0175	1.07430804
OTHR	1	-0.002226	0.02033001	-0.109	0.9128	1.04885564
DIVORC	1	0.011156	0.01800241	0.620	0.5355	1.06462709
SINGL	1	-0.018554	0.02006985	-0.924	0.3553	1.06471501
AGE	1	0.000834	0.00239913	0.348	0.7282	3.01849966
FEMALE	1	0.003337	0.02369069	0.141	0.8880	1.06499129
TIG	1	0.006377	0.00286636	2.225	0.0261	2.30291969
YOS	1	0.007754	0.00405352	1.913	0.0558	5.58941964
ADD_PAY	1	0.000605	0.00222223	0.272	0.7854	1.31905150
REBONUS	1	0.003368	0.01177577	0.286	0.7749	1.05663732
CONT_EXP	1	0.025328	0.02993030	0.846	0.3974	1.02868440
E5	1	0.472507	0.01697138	27.841	0.0001	1.75321167
E7	1	0.271929	0.01775354	15.317	0.0001	2.60366629

Model: MODEL1
Dependent Variable: PI_M

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	22	326.10470	14.82294	69.510	0.0001
Error	8798	1876.15173	0.21325		
C Total	8820	2202.25643			

Root MSE	0.46179	R-square	0.1481
Dep Mean	0.48158	Adj R-sq	0.1459
C.V.	95.89044		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Variance Inflation
INTERCEP	1	0.200109	0.07064272	2.833	0.0046	0.00000000
NODUTY	1	-0.009306	0.08918711	-0.104	0.9169	1.00404366
NHSG	1	0.019404	0.08608099	0.225	0.8217	1.00438067
COLL	1	-0.055133	0.01625091	-3.393	0.0007	1.06144164
F_RCTRD1	1	0.036974	0.01467989	2.519	0.0118	1.73982952
PFTSCORE	1	-0.000021641	0.00008320	-0.260	0.7948	1.15899834
ADDMOS	1	-0.033036	0.01196127	-2.762	0.0058	1.46960590
DEPLTIME	1	0.001954	0.00171142	1.142	0.2537	1.11169441
DCTB_YRS	1	0.002458	0.00329084	0.747	0.4551	1.08799533
DAUS_DR1	1	-0.001106	0.00110930	-0.997	0.3187	1.06661321
GEOBACH	1	-0.010380	0.01166088	-0.890	0.3734	1.09925958
BLCK	1	-0.025736	0.01115506	-2.307	0.0211	1.07284406
OTHR	1	-0.002126	0.02033301	-0.105	0.9167	1.04884878
DIVORC	1	0.011338	0.01800487	0.630	0.5289	1.06459736
SINGL	1	-0.020728	0.02004066	-1.034	0.3010	1.06129962
AGE	1	0.003297	0.00202440	1.629	0.1034	2.14854216
FEMALE	1	0.000264	0.02363972	0.011	0.9911	1.06009340
TIG	1	0.009530	0.00234549	4.063	0.0001	1.54153713
ADD_PAY	1	0.000401	0.00221999	0.180	0.8568	1.31599151
REBONUS	1	0.001420	0.01173345	0.121	0.9037	1.04873927
CONT_EXP	1	0.026951	0.02992279	0.901	0.3678	1.02785767
E5	1	0.457819	0.01513724	30.245	0.0001	1.39431819
E7	1	0.292434	0.01415397	20.661	0.0001	1.65440049

The SAS System 13:40 Thursday, Ja

Model: MODEL1
Dependent Variable: SSBVS1

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	39	61.85178	1.58594	16.863	0.0001
Error	4192	394.25408	0.09405		
C Total	4231	456.10586			

Root MSE	0.30667	R-square	0.1356
Dep Mean	0.12287	Adj R-sq	0.1276
C.V.	249.58575		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Variance Inflation
INTERCEP	1	0.626635	0.12050202	5.200	0.0001	0.00000000
NODUTY	1	-0.054625	0.08252759	-0.662	0.5081	1.01049066
NHSG	1	0.052143	0.07965674	0.655	0.5128	1.00841498
COLL	1	-0.016135	0.01729441	-0.933	0.3509	1.16986751
GTGCTTOT	1	-0.000360	0.00038313	-0.939	0.3477	1.40297715
P1	1	-0.008233	0.00995477	-0.827	0.4083	1.21391083
F_RCTRDI	1	0.009351	0.01450046	0.645	0.5190	1.82751442
PFTSCORE	1	-0.000269	0.00008084	-3.329	0.0009	1.24023563
N_ADDMOS	1	0.013944	0.01166816	1.195	0.2321	1.52696130
DEPLTIME	1	-0.001188	0.00176014	-0.675	0.4997	1.37437074
DCT8_YRS	1	0.000561	0.00300369	0.187	0.8519	1.10311980
SECUR_DU	1	0.041552	0.02428924	1.711	0.0872	1.17255870
NFHF_DU	1	-0.001911	0.01464719	-0.130	0.8962	1.39436350
RCTG_DU	1	0.022510	0.02741609	0.821	0.4117	1.75250199
INDEP_DU	1	0.066133	0.01565788	4.224	0.0001	1.13344843
SCH_DU	1	-0.033173	0.02099799	-1.580	0.1142	1.18503987
DAUS_DR1	1	-0.001531	0.00110997	-1.379	0.1680	1.13681569
N_INMOS	1	-0.018716	0.01342621	-1.394	0.1634	1.41105281
GEOBACH	1	0.004720	0.01133195	0.416	0.6771	1.13154871
BLCK	1	-0.016830	0.01179832	-1.426	0.1538	1.26603481
OTHR	1	0.018198	0.02060013	0.883	0.3771	1.17981588
NBORNCIT	1	0.005149	0.01734219	0.297	0.7665	1.10605554
DIVORC	1	0.015998	0.01842748	0.868	0.3854	1.23101954
SINGL	1	0.002950	0.02273125	0.130	0.8968	1.35032374
NUMDEP	1	0.003663	0.00398774	0.919	0.3584	1.51504604
AGE	1	-0.004270	0.00230930	-1.849	0.0645	3.28446701
FEMALE	1	0.035171	0.02573992	1.366	0.1719	1.22698768
TIG	1	-0.000736	0.00283689	-0.260	0.7952	2.10521563
YOS	1	-0.016484	0.00408885	-4.031	0.0001	6.74604528
ADSPOUS	1	0.034776	0.02194913	1.584	0.1132	1.19592831
ADD_PAY	1	-0.002141	0.00268195	-0.798	0.4247	1.98088184
NREBONUS	1	0.005166	0.01148081	0.450	0.6528	1.12458821
ADMINSUP	1	-0.002101	0.01444832	-0.145	0.8844	1.78543638
CSS_T	1	0.107261	0.01617358	6.632	0.0001	1.57797301
CSS_NT	1	-0.031322	0.01715338	-1.826	0.0679	1.40565772
GARSUP	1	0.035942	0.02279925	1.576	0.1150	1.30011471
ELECAVN	1	0.087133	0.01824624	4.775	0.0001	1.57972137
E5	1	0.069285	0.01736899	3.989	0.0001	2.78660348
E7	1	-0.004746	0.01777395	-0.267	0.7895	3.23681556
TT_EASSQ	1	-0.000028916	0.00000442	-6.544	0.0001	1.36449933

Model: MODEL1
Dependent Variable: SSBVS1

Analysis of Varience

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	38	60.32320	1.58745	16.818	0.0001
Error	4193	395.78266	0.09439		
C Total	4231	456.10586			

Root MSE	0.30723	R-square	0.1323
Dep Mean	0.12287	Adj R-sq	0.1244
C.V.	250.03930		

Parameter Estimates

Veriable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Variance Inflation
INTERCEP	1	0.570716	0.11991857	4.759	0.0001	0.00000000
NODUTY	1	-0.056240	0.08267658	-0.680	0.4964	1.01046685
NHSG	1	0.063895	0.07974804	0.801	0.4231	1.00706466
COLL	1	-0.003442	0.01703633	-0.202	0.8399	1.13109779
GTGCTTOT	1	-0.000345	0.00038381	-0.898	0.3693	1.40284180
PI	1	-0.006279	0.00996103	-0.630	0.5285	1.21103384
F_RCTRDI	1	0.012007	0.01451181	0.827	0.4081	1.82374181
PFTSCORE	1	-0.000243	0.00008073	-3.012	0.0026	1.23235999
N_ADDMOS	1	0.014366	0.01168889	1.229	0.2191	1.52683825
DEPLTIME	1	-0.001161	0.00176332	-0.659	0.5102	1.37435084
DCT8_YRS	1	0.000365	0.00300875	0.121	0.9034	1.10283127
SECUR_DU	1	0.040851	0.02433276	1.679	0.0933	1.17249865
NFMF_DU	1	-0.002953	0.01467152	-0.201	0.8405	1.39392916
RCTG_DU	1	0.021657	0.02746510	0.789	0.4304	1.75239772
INDEP_DU	1	0.066795	0.01568547	4.258	0.0001	1.13332379
SCH_DU	1	-0.034097	0.02103489	-1.621	0.1051	1.18489875
DAUS_DR1	1	-0.001476	0.00111190	-1.327	0.1846	1.13664304
N_INMOS	1	-0.020091	0.01344627	-1.494	0.1352	1.41014232
GEOBACH	1	0.005695	0.01134996	0.502	0.6159	1.13103293
BLCK	1	-0.017821	0.01181719	-1.508	0.1316	1.26548482
OTHR	1	0.020039	0.02063249	0.971	0.3315	1.17923612
NBORNCIT	1	0.004971	0.01737364	0.286	0.7748	1.10604831
DIVORC	1	0.013088	0.01844680	0.710	0.4780	1.22913146
SINGL	1	0.003123	0.02277252	0.137	0.8909	1.35031895
NUMDEP	1	0.002460	0.00398378	0.617	0.5369	1.50655977
AGE	1	-0.009120	0.00197475	-4.618	0.0001	2.39305522
FEMALE	1	0.044129	0.02569044	1.718	0.0859	1.21784463
TIG	1	-0.006654	0.00243204	-2.736	0.0062	1.54160944
ADSPOUS	1	0.031612	0.02197496	1.439	0.1503	1.19440007
ADD_PAY	1	-0.001781	0.00268533	-0.663	0.5072	1.97868591
NREBONUS	1	0.003016	0.01148926	0.263	0.7929	1.12216332
ADMINSUP	1	-0.005417	0.01445111	-0.375	0.7078	1.77965110
CSS_T	1	0.105456	0.01619676	6.511	0.0001	1.57676379
CSS_NT	1	-0.036480	0.01713668	-2.129	0.0333	1.39783581
GARSUP	1	0.030106	0.02279460	1.321	0.1867	1.29487489
ELECAVN	1	0.089659	0.01826861	4.908	0.0001	1.57785757
E5	1	0.104750	0.01500373	6.982	0.0001	2.07179876
E7	1	-0.047881	0.01421857	-3.367	0.0008	2.06388246
TT_EASSQ	1	-0.000025460	0.00000434	-5.863	0.0001	1.31313866

APPENDIX E

HECKMAN MODEL CROSS-TABULATION TABLES

This appendix contains all the cross-tabulation tables associated with the Heckman model's response variable (dependent variable) PI_M, and the model's independent variables.

The SAS System

TABLE OF P1_M BY NODUTY

```
P1_M      NODUTY

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |   4718 |     13 |   4731
         |  51.74 |   0.14 |  51.89
         |  99.73 |   0.27 |
         |  51.91 |  44.83 |
---------+--------+--------+
       1 |   4371 |     16 |   4387
         |  47.94 |   0.18 |  48.11
         |  99.64 |   0.36 |
         |  48.09 |  55.17 |
---------+--------+--------+
Total        9089       29     9118
            99.68     0.32   100.00
```

TABLE OF P1_M BY HSG

```
P1_M      HSG

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |     15 |   4716 |   4731
         |   0.16 |  51.72 |  51.89
         |   0.32 |  99.68 |
         |  48.39 |  51.90 |
---------+--------+--------+
       1 |     16 |   4371 |   4387
         |   0.18 |  47.94 |  48.11
         |   0.36 |  99.64 |
         |  51.61 |  48.10 |
---------+--------+--------+
Total          31     9087     9118
             0.34    99.66   100.00
```

TABLE OF P1_M BY NHSG

```
P1_M      NHSG

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |   4716 |     15 |   4731
         |  51.72 |   0.16 |  51.89
         |  99.68 |   0.32 |
         |  51.90 |  48.39 |
---------+--------+--------+
       1 |   4371 |     16 |   4387
         |  47.94 |   0.18 |  48.11
         |  99.64 |   0.36 |
         |  48.10 |  51.61 |
---------+--------+--------+
Total        9087       31     9118
            99.66     0.34   100.00
```

The SAS System

TABLE OF PI_M BY COLL

PI_M COLL

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	4165	566	4731
	45.68	6.21	51.89
	88.04	11.96	
	51.20	57.58	
1	3970	417	4387
	43.54	4.57	48.11
	90.49	9.51	
	48.80	42.42	
Total	8135	983	9118
	89.22	10.78	100.00

TABLE OF PI_M BY F_RCTRDI

PI_M F_RCTRDI

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	3455	1276	4731
	37.89	13.99	51.89
	73.03	26.97	
	51.65	52.53	
1	3234	1153	4387
	35.47	12.65	48.11
	73.72	26.28	
	48.35	47.47	
Total	6689	2429	9118
	73.36	26.64	100.00

TABLE OF PI_M BY ADDMOS

PI_M ADDMOS

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	2116	2615	4731
	23.21	28.68	51.89
	44.73	55.27	
	50.47	53.10	
1	2077	2310	4387
	22.78	25.33	48.11
	47.34	52.66	
	49.53	46.90	
Total	4193	4925	9118
	45.99	54.01	100.00

```
                    The SAS System

              TABLE OF PI_M BY GEOBACH

PI_M      GEOBACH

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |   3462 |   1269 |   4731
         |  37.97 |  13.92 |  51.89
         |  73.18 |  26.82 |
         |  51.87 |  51.94 |
---------+--------+--------+
       1 |   3213 |   1174 |   4387
         |  35.24 |  12.88 |  48.11
         |  73.24 |  26.76 |
         |  48.13 |  48.06 |
---------+--------+--------+
Total        6675     2443     9118
            73.21    26.79   100.00

              TABLE OF PI_M BY CAUC

PI_M      CAUC

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |   1779 |   2952 |   4731
         |  19.51 |  32.38 |  51.89
         |  37.60 |  62.40 |
         |  53.73 |  50.84 |
---------+--------+--------+
       1 |   1532 |   2855 |   4387
         |  16.80 |  31.31 |  48.11
         |  34.92 |  65.08 |
         |  46.27 |  49.16 |
---------+--------+--------+
Total        3311     5807     9118
            36.31    63.69   100.00

              TABLE OF PI_M BY BLCK

PI_M      BLCK

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |   3262 |   1469 |   4731
         |  35.78 |  16.11 |  51.89
         |  68.95 |  31.05 |
         |  50.93 |  54.15 |
---------+--------+--------+
       1 |   3143 |   1244 |   4387
         |  34.47 |  13.64 |  48.11
         |  71.64 |  28.36 |
         |  49.07 |  45.85 |
---------+--------+--------+
Total        6405     2713     9118
            70.25    29.75   100.00
```

The SAS System

TABLE OF PI_M BY OTHR

PI_M / OTHR (Frequency, Percent, Row Pct, Col Pct)	0	1	Total
0	4421	310	4731
	48.49	3.40	51.89
	93.45	6.55	
	51.89	51.84	
1	4099	288	4387
	44.96	3.16	48.11
	93.44	6.56	
	48.11	48.16	
Total	8520	598	9118
	93.44	6.56	100.00

TABLE OF PI_M BY DIVORC

PI_M / DIVORC (Frequency, Percent, Row Pct, Col Pct)	0	1	Total
0	4324	407	4731
	47.42	4.46	51.89
	91.40	8.60	
	51.91	51.65	
1	4006	381	4387
	43.94	4.18	48.11
	91.32	8.68	
	48.09	48.35	
Total	8330	788	9118
	91.36	8.64	100.00

TABLE OF PI_M BY MARRIED

PI_M / MARRIED (Frequency, Percent, Row Pct, Col Pct)	0	1	Total
0	748	3983	4731
	8.20	43.68	51.89
	15.81	84.19	
	52.71	51.73	
1	671	3716	4387
	7.36	40.75	48.11
	15.30	84.70	
	47.29	48.27	
Total	1419	7699	9118
	15.56	84.44	100.00

The SAS System

TABLE OF PI_M BY SINGL

PI_M	SINGL			
Frequency / Percent / Row Pct / Col Pct		0	1	Total
0	Frequency	4390	341	4731
	Percent	48.15	3.74	51.89
	Row Pct	92.79	7.21	
	Col Pct	51.73	54.04	
1	Frequency	4097	290	4387
	Percent	44.93	3.18	48.11
	Row Pct	93.39	6.61	
	Col Pct	48.27	45.96	
Total		8487	631	9118
		93.08	6.92	100.00

TABLE OF PI_M BY FEMALE

PI_M	FEMALE			
Frequency / Percent / Row Pct / Col Pct		0	1	Total
0	Frequency	4479	252	4731
	Percent	49.12	2.76	51.89
	Row Pct	94.67	5.33	
	Col Pct	51.61	57.40	
1	Frequency	4200	187	4387
	Percent	46.06	2.05	48.11
	Row Pct	95.74	4.26	
	Col Pct	48.39	42.60	
Total		8679	439	9118
		95.19	4.81	100.00

TABLE OF PI_M BY REBONUS

PI_M	REBONUS			
Frequency / Percent / Row Pct / Col Pct		0	1	Total
0	Frequency	1099	3632	4731
	Percent	12.05	39.83	51.89
	Row Pct	23.23	76.77	
	Col Pct	49.48	52.66	
1	Frequency	1122	3265	4387
	Percent	12.31	35.81	48.11
	Row Pct	25.58	74.42	
	Col Pct	50.52	47.34	
Total		2221	6897	9118
		24.36	75.64	100.00

The SAS System

TABLE OF PI_M BY E5

PI_M / E5 Frequency Percent Row Pct Col Pct	0	1	Total
0	4376 47.99 92.50 58.47	355 3.89 7.50 21.73	4731 51.89
1	3108 34.09 70.85 41.53	1279 14.03 29.15 78.27	4387 48.11
Total	7484 82.08	1634 17.92	9118 100.00

TABLE OF PI_M BY E6

PI_M / E6 Frequency Percent Row Pct Col Pct	0	1	Total
0	1335 14.64 28.22 32.24	3396 37.25 71.78 68.23	4731 51.89
1	2806 30.77 63.96 67.76	1581 17.34 36.04 31.77	4387 48.11
Total	4141 45.42	4977 54.58	9118 100.00

The SAS System

TABLE OF PI_M BY E7

PI_M / E7 (Frequency, Percent, Row Pct, Col Pct)	0	1	Total
0	3751	980	4731
	41.14	10.75	51.89
	79.29	20.71	
	56.74	39.09	
1	2860	1527	4387
	31.37	16.75	48.11
	65.19	34.81	
	43.26	60.91	
Total	6611	2507	9118
	72.50	27.50	100.00

TABLE OF PI_M BY CONT_EXP

PI_M / CONT_EXP (Frequency, Percent, Row Pct, Col Pct)	0	1	Total
0	4632	99	4731
	50.80	1.09	51.89
	97.91	2.09	
	52.29	38.22	
1	4227	160	4387
	46.36	1.75	48.11
	96.35	3.65	
	47.71	61.78	
Total	8859	259	9118
	97.16	2.84	100.00

APPENDIX F

MAIN MODEL CROSS-TABULATION TABLES

This appendix contains all the cross-tabulation tables associated with the Main model's response variable (dependent variable) SSBVSI, and the model's independent variables.

The SAS System

TABLE OF SSBVSI BY NODUTY

SSBVSI NODUTY

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	3839	15	3854
	87.51	0.34	87.85
	99.61	0.39	
	87.83	93.75	
1	532	1	533
	12.13	0.02	12.15
	99.81	0.19	
	12.17	6.25	
Total	4371	16	4387
	99.64	0.36	100.00

TABLE OF SSBVSI BY NHSG

SSBVSI NHSG

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	3840	14	3854
	87.53	0.32	87.85
	99.64	0.36	
	87.85	87.50	
1	531	2	533
	12.10	0.05	12.15
	99.62	0.38	
	12.15	12.50	
Total	4371	16	4387
	99.64	0.36	100.00

TABLE OF SSBVSI BY HSG

SSBVSI HSG

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	14	3840	3854
	0.32	87.53	87.85
	0.36	99.64	
	87.50	87.85	
1	2	531	533
	0.05	12.10	12.15
	0.38	99.62	
	12.50	12.15	
Total	16	4371	4387
	0.36	99.64	100.00

TABLE OF SSBVSI BY COLL

SSBVSI COLL

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	3473	381	3854
	79.17	8.68	87.85
	90.11	9.89	
	87.48	91.37	
1	497	36	533
	11.33	0.82	12.15
	93.25	6.75	
	12.52	8.63	
Total	3970	417	4387
	90.49	9.51	100.00

TABLE OF SSBVSI BY P1

SSBVSI P1

Frequency / Percent / Row Pct / Col Pct	3.5	4.8	5	5.4	5.5	5.6	5.7	5.9	6	6.1	Total
0	1	1	1	3	2	1	2	2	3	4	3854
	0.02	0.02	0.02	0.07	0.05	0.02	0.05	0.05	0.07	0.09	87.85
	0.03	0.03	0.03	0.08	0.05	0.03	0.05	0.05	0.08	0.10	
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	75.00	80.00	
1	0	0	0	0	0	0	0	0	1	1	533
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	12.15
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.19	
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	20.00	
Total	1	1	1	3	2	1	2	2	4	5	4387
	0.02	0.02	0.02	0.07	0.05	0.02	0.05	0.05	0.09	0.11	100.00

(Continued)

TABLE OF SSBVS1 BY P1

SSBVS1 P1

SSBVS1 (Frequency / Percent / Row Pct / Col Pct)	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7	7.1	Total
0	9	3	7	5	5	9	9	10	14	13	3854
	0.21	0.07	0.16	0.11	0.11	0.21	0.21	0.23	0.32	0.30	87.85
	0.23	0.08	0.18	0.13	0.13	0.23	0.23	0.26	0.36	0.34	
	100.00	60.00	77.78	100.00	100.00	100.00	81.82	83.33	87.50	81.25	
1	0	2	2	0	0	0	2	2	2	3	533
	0.00	0.05	0.05	0.00	0.00	0.00	0.05	0.05	0.05	0.07	12.15
	0.00	0.38	0.38	0.00	0.00	0.00	0.38	0.38	0.38	0.56	
	0.00	40.00	22.22	0.00	0.00	0.00	18.18	16.67	12.50	18.75	
Total	9	5	9	5	5	9	11	12	16	16	4387
	0.21	0.11	0.21	0.11	0.11	0.21	0.25	0.27	0.36	0.36	100.00

(Continued)

TABLE OF SSBVS1 BY P1

SSBVS1 P1

SSBVS1 (Frequency / Percent / Row Pct / Col Pct)	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8	8.1	Total
0	31	24	32	40	49	55	82	95	142	148	3854
	0.71	0.55	0.73	0.91	1.12	1.25	1.87	2.17	3.24	3.37	87.85
	0.80	0.62	0.83	1.04	1.27	1.43	2.13	2.46	3.68	3.84	
	86.11	82.76	80.00	86.96	83.05	78.57	78.10	85.59	84.02	85.55	
1	5	5	8	6	10	15	23	16	27	25	533
	0.11	0.11	0.18	0.14	0.23	0.34	0.52	0.36	0.62	0.57	12.15
	0.94	0.94	1.50	1.13	1.88	2.81	4.32	3.00	5.07	4.69	
	13.89	17.24	20.00	13.04	16.95	21.43	21.90	14.41	15.98	14.45	
Total	36	29	40	46	59	70	105	111	169	173	4387
	0.82	0.66	0.91	1.05	1.34	1.60	2.39	2.53	3.85	3.94	100.00

(Continued)

TABLE OF SSBVSI BY PI

SSBVSI PI

Frequency / Percent / Row Pct / Col Pct	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9	Total
0	162	233	271	294	384	428	488	478	314	3854
	3.69	5.31	6.18	6.70	8.75	9.76	11.12	10.90	7.16	87.85
	4.20	6.05	7.03	7.63	9.96	11.11	12.66	12.40	8.15	
	80.20	86.62	84.42	85.22	87.07	89.73	90.54	94.28	95.44	
1	40	36	50	51	57	49	51	29	15	533
	0.91	0.82	1.14	1.16	1.30	1.12	1.16	0.66	0.34	12.15
	7.50	6.75	9.38	9.57	10.69	9.19	9.57	5.44	2.81	
	19.80	13.38	15.58	14.78	12.93	10.27	9.46	5.72	4.56	
Total	202	269	321	345	441	477	539	507	329	4387
	4.60	6.13	7.32	7.86	10.05	10.87	12.29	11.56	7.50	100.00

TABLE OF SSBVSI BY F_RCTRDI

SSBVSI F_RCTRDI

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	2794	1060	3854
	63.69	24.16	87.85
	72.50	27.50	
	86.39	91.93	
1	440	93	533
	10.03	2.12	12.15
	82.55	17.45	
	13.61	8.07	
Total	3234	1153	4387
	73.72	26.28	100.00

```
                    The SAS System

            TABLE OF SS8VSI BY N_ADDMOS

SS8VSI     N_ADDMOS

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |   2077 |   1777 |   3854
         |  47.34 |  40.51 |  87.85
         |  53.89 |  46.11 |
         |  89.91 |  85.56 |
---------+--------+--------+
       1 |    233 |    300 |    533
         |   5.31 |   6.84 |  12.15
         |  43.71 |  56.29 |
         |  10.09 |  14.44 |
---------+--------+--------+
Total        2310     2077     4387
            52.66    47.34   100.00

            TABLE OF SS8VSI BY SECUR_DU

SS8VSI     SECUR_DU

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |   3666 |    188 |   3854
         |  83.57 |   4.29 |  87.85
         |  95.12 |   4.88 |
         |  87.72 |  90.38 |
---------+--------+--------+
       1 |    513 |     20 |    533
         |  11.69 |   0.46 |  12.15
         |  96.25 |   3.75 |
         |  12.28 |   9.62 |
---------+--------+--------+
Total        4179      208     4387
            95.26     4.74   100.00

            TABLE OF SS8VSI BY FMF_DU

SS8VSI     FMF_DU

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |   1770 |   2084 |   3854
         |  40.35 |  47.50 |  87.85
         |  45.93 |  54.07 |
         |  87.93 |  87.78 |
---------+--------+--------+
       1 |    243 |    290 |    533
         |   5.54 |   6.61 |  12.15
         |  45.59 |  54.41 |
         |  12.07 |  12.22 |
---------+--------+--------+
Total        2013     2374     4387
            45.89    54.11   100.00
```

The SAS System

TABLE OF SS8VSI BY NFMF_DU

```
SS8VSI     NFMF_DU

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |   3152 |    702 |   3854
         |  71.85 |  16.00 |  87.85
         |  81.79 |  18.21 |
         |  87.26 |  90.58 |
---------+--------+--------+
       1 |    460 |     73 |    533
         |  10.49 |   1.66 |  12.15
         |  86.30 |  13.70 |
         |  12.74 |   9.42 |
---------+--------+--------+
Total        3612      775     4387
            82.33    17.67   100.00
```

TABLE OF SS8VSI BY RCTG_DU

```
SS8VSI     RCTG_DU

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |   3644 |    210 |   3854
         |  83.06 |   4.79 |  87.85
         |  94.55 |   5.45 |
         |  87.85 |  87.87 |
---------+--------+--------+
       1 |    504 |     29 |    533
         |  11.49 |   0.66 |  12.15
         |  94.56 |   5.44 |
         |  12.15 |  12.13 |
---------+--------+--------+
Total        4148      239     4387
            94.55     5.45   100.00
```

TABLE OF SS8VSI BY INDEP_DU

```
SS8VSI     INDEP_DU

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |   3452 |    402 |   3854
         |  78.69 |   9.16 |  87.85
         |  89.57 |  10.43 |
         |  88.90 |  79.76 |
---------+--------+--------+
       1 |    431 |    102 |    533
         |   9.82 |   2.33 |  12.15
         |  80.86 |  19.14 |
         |  11.10 |  20.24 |
---------+--------+--------+
Total        3883      504     4387
            88.51    11.49   100.00
```

The SAS System

TABLE OF SSBVSI BY SCH_OU

SSBVSI   SCH_OU

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	3586	268	3854
	81.74	6.11	87.85
	93.05	6.95	
	87.46	93.38	
1	514	19	533
	11.72	0.43	12.15
	96.44	3.56	
	12.54	6.62	
Total	4100	287	4387
	93.46	6.54	100.00

TABLE OF SSBVSI BY N_INMOS

SSBVSI   N_INMOS

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	2907	947	3854
	66.26	21.59	87.85
	75.43	24.57	
	87.38	89.34	
1	420	113	533
	9.57	2.58	12.15
	78.80	21.20	
	12.62	10.66	
Total	3327	1060	4387
	75.84	24.16	100.00

TABLE OF SSBVSI BY GEOBACH

SSBVSI   GEOBACH

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	2820	1034	3854
	64.28	23.57	87.85
	73.17	26.83	
	87.77	88.07	
1	393	140	533
	8.96	3.19	12.15
	73.73	26.27	
	12.23	11.93	
Total	3213	1174	4387
	73.24	26.76	100.00

The SAS System

TABLE OF SSBVSI BY BLCK

SSBVSI BLCK

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	2737	1117	3854
	62.39	25.46	87.85
	71.02	28.98	
	87.08	89.79	
1	406	127	533
	9.25	2.89	12.15
	76.17	23.83	
	12.92	10.21	
Total	3143	1244	4387
	71.64	28.36	100.00

TABLE OF SSBVSI BY OTHR

SSBVSI OTHR

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	3607	247	3854
	82.22	5.63	87.85
	93.59	6.41	
	88.00	85.76	
1	492	41	533
	11.21	0.93	12.15
	92.31	7.69	
	12.00	14.24	
Total	4099	288	4387
	93.44	6.56	100.00

TABLE OF SSBVSI BY CAUC

SSBVSI CAUC

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	1364	2490	3854
	31.09	56.76	87.85
	35.39	64.61	
	89.03	87.22	
1	168	365	533
	3.83	8.32	12.15
	31.52	68.48	
	10.97	12.78	
Total	1532	2855	4387
	34.92	65.08	100.00

```
                 The SAS System

           TABLE OF SSBVSI BY NBORNCIT

SSBVSI     NBORNCIT

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |   3508 |    346 |   3854
         |  79.96 |   7.89 |  87.85
         |  91.02 |   8.98 |
         |  87.79 |  88.49 |
---------+--------+--------+
       1 |    488 |     45 |    533
         |  11.12 |   1.03 |  12.15
         |  91.56 |   8.44 |
         |  12.21 |  11.51 |
---------+--------+--------+
Total        3996      391     4387
            91.09     8.91   100.00

            TABLE OF SSBVSI BY DIVORC

SSBVSI     DIVORC

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |   3521 |    333 |   3854
         |  80.26 |   7.59 |  87.85
         |  91.36 |   8.64 |
         |  87.89 |  87.40 |
---------+--------+--------+
       1 |    485 |     48 |    533
         |  11.06 |   1.09 |  12.15
         |  90.99 |   9.01 |
         |  12.11 |  12.60 |
---------+--------+--------+
Total        4006      381     4387
            91.32     8.68   100.00

            TABLE OF SSBVSI BY MARRIED

SSBVSI     MARRIED

Frequency|
Percent  |
Row Pct  |
Col Pct  |       0|       1|  Total
---------+--------+--------+
       0 |    579 |   3275 |   3854
         |  13.20 |  74.65 |  87.85
         |  15.02 |  84.98 |
         |  86.29 |  88.13 |
---------+--------+--------+
       1 |     92 |    441 |    533
         |   2.10 |  10.05 |  12.15
         |  17.26 |  82.74 |
         |  13.71 |  11.87 |
---------+--------+--------+
Total         671     3716     4387
            15.30    84.70   100.00
```

The SAS System

TABLE OF SS8VSI BY SINGL

SS8VSI / SINGL (Frequency / Percent / Row Pct / Col Pct)	0	1	Total
0	3608	246	3854
	82.24	5.61	87.85
	93.62	6.38	
	88.06	84.83	
1	489	44	533
	11.15	1.00	12.15
	91.74	8.26	
	11.94	15.17	
Total	4097	290	4387
	93.39	6.61	100.00

TABLE OF SS8VSI BY FEMALE

SS8VSI / FEMALE (Frequency / Percent / Row Pct / Col Pct)	0	1	Total
0	3697	157	3854
	84.27	3.58	87.85
	95.93	4.07	
	88.02	83.96	
1	503	30	533
	11.47	0.68	12.15
	94.37	5.63	
	11.98	16.04	
Total	4200	187	4387
	95.74	4.26	100.00

TABLE OF SS8VSI BY ADSPOUS

SS8VSI / ADSPOUS (Frequency / Percent / Row Pct / Col Pct)	0	1	Total
0	3636	218	3854
	82.88	4.97	87.85
	94.34	5.66	
	88.06	84.50	
1	493	40	533
	11.24	0.91	12.15
	92.50	7.50	
	11.94	15.50	
Total	4129	258	4387
	94.12	5.88	100.00

TABLE OF SSBVSI BY ADD_PAY

SSBVSI ADD_PAY

Frequency / Percent / Row Pct / Col Pct	0	2	2.2	3	4.4	6	6.6	8.8	Total
0	3329	1	43	1	67	30	158	225	3854
	75.88	0.02	0.98	0.02	1.53	0.68	3.60	5.13	87.85
	86.38	0.03	1.12	0.03	1.74	0.78	4.10	5.84	
	87.63	100.00	81.13	100.00	91.78	96.77	90.80	88.24	
1	470	0	10	0	6	1	16	30	533
	10.71	0.00	0.23	0.00	0.14	0.02	0.36	0.68	12.15
	88.18	0.00	1.88	0.00	1.13	0.19	3.00	5.63	
	12.37	0.00	18.87	0.00	8.22	3.23	9.20	11.76	
Total	3799	1	53	1	73	31	174	255	4387
	86.60	0.02	1.21	0.02	1.66	0.71	3.97	5.81	100.00

TABLE OF SS8VSI BY NREBONUS

SSBVSI NREBONUS

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	2881	973	3854
	65.67	22.18	87.85
	74.75	25.25	
	88.24	86.72	
1	384	149	533
	8.75	3.40	12.15
	72.05	27.95	
	11.76	13.28	
Total	3265	1122	4387
	74.42	25.58	100.00

The SAS System

TABLE OF SSBVS1 BY ADMINSUP

SSBVS1 ADMINSUP

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	2827	1027	3854
	64.44	23.41	87.85
	73.35	26.65	
	86.37	92.19	
1	446	87	533
	10.17	1.98	12.15
	83.68	16.32	
	13.63	7.81	
Total	3273	1114	4387
	74.61	25.39	100.00

TABLE OF SSBVS1 BY CMBTARMS

SSBVS1 CMBTARMS

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	2679	1175	3854
	61.07	26.78	87.85
	69.51	30.49	
	85.54	93.63	
1	453	80	533
	10.33	1.82	12.15
	84.99	15.01	
	14.46	6.37	
Total	3132	1255	4387
	71.39	28.61	100.00

TABLE OF SSBVS1 BY CSS_T

SSBVS1 CSS_T

Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	3331	523	3854
	75.93	11.92	87.85
	86.43	13.57	
	90.22	75.25	
1	361	172	533
	8.23	3.92	12.15
	67.73	32.27	
	9.78	24.75	
Total	3692	695	4387
	84.16	15.84	100.00

The SAS System

TABLE OF SSBVS1 BY GARSUP

SSBVS1 / GARSUP (Frequency, Percent, Row Pct, Col Pct)	0	1	Total
0	3624	230	3854
	82.61	5.24	87.85
	94.03	5.97	
	87.88	87.45	
1	500	33	533
	11.40	0.75	12.15
	93.81	6.19	
	12.12	12.55	
Total	4124	263	4387
	94.01	5.99	100.00

TABLE OF SS8VS1 BY ELECAVN

SS8VS1 / ELECAVN (Frequency, Percent, Row Pct, Col Pct)	0	1	Total
0	3438	416	3854
	78.37	9.48	87.85
	89.21	10.79	
	89.09	78.79	
1	421	112	533
	9.60	2.55	12.15
	78.99	21.01	
	10.91	21.21	
Total	3859	528	4387
	87.96	12.04	100.00

TABLE OF SS8VS1 BY CSS_NT

SSBVS1 / CSS_NT (Frequency, Percent, Row Pct, Col Pct)	0	1	Total
0	3371	483	3854
	76.84	11.01	87.85
	87.47	12.53	
	87.44	90.79	
1	484	49	533
	11.03	1.12	12.15
	90.81	9.19	
	12.56	9.21	
Total	3855	532	4387
	87.87	12.13	100.00

The SAS System

TABLE OF SSBVSI BY E5

SS8VSI / E5 (Frequency / Percent / Row Pct / Col Pct)	0	1	Total
0	2907 66.26 75.43 93.53	947 21.59 24.57 74.04	3854 87.85
1	201 4.58 37.71 6.47	332 7.57 62.29 25.96	533 12.15
Total	3108 70.85	1279 29.15	4387 100.00

TABLE OF SS8VSI BY E6

SS8VSI / E6 (Frequency / Percent / Row Pct / Col Pct)	0	1	Total
0	2426 55.30 62.95 86.46	1428 32.55 37.05 90.32	3854 87.85
1	380 8.66 71.29 13.54	153 3.49 28.71 9.68	533 12.15
Total	2806 63.96	1581 36.04	4387 100.00

The SAS System

TABLE OF SSBVS1 BY E7

SSBVS1 / E7 — Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	2375	1479	3854
	54.14	33.71	87.85
	61.62	38.38	
	83.04	96.86	
1	485	48	533
	11.06	1.09	12.15
	90.99	9.01	
	16.96	3.14	
Total	2860	1527	4387
	65.19	34.81	100.00

TABLE OF SSBVSI BY NO_PFT

SSBVS1 / NO_PFT — Frequency / Percent / Row Pct / Col Pct	0	1	Total
0	3685	169	3854
	84.00	3.85	87.85
	95.61	4.39	
	87.80	88.95	
1	512	21	533
	11.67	0.48	12.15
	96.06	3.94	
	12.20	11.05	
Total	4197	190	4387
	95.67	4.33	100.00

APPENDIX G

LOGIT REGRESSION RESULTS (MAIN MODEL)

This appendix contains the SAS Version 6 read-outs for the computer running of the Main Logit model.

The SAS System 16:30 Thurs

The LOGISTIC Procedure

Data Set: WORK.VSISS8
Response Variable: SS8VSI
Response Levels: 2
Number of Observations: 4232
Link Function: Logit

Response Profile

Ordered Value	SS8VSI	Count
1	0	520
2	1	3712

WARNING: 155 observation(s) were deleted due to missing values for the response or explanatory variables.

Criteria for Assessing Model Fit

Criterion	Intercept Only	Intercept and Covariates	Chi-Square for Covariates
AIC	3155.780	2659.054	.
SC	3162.131	2913.071	.
-2 LOG L	3153.780	2579.054	574.726 with 39 DF (p=0.0001)
Score	.	.	576.974 with 39 DF (p=0.0001)

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Wald Chi-Square	Pr > Chi-Square	Standardized Estimate	Odds Ratio
INTERCPT	1	1.3947	1.3077	1.1375	0.2862	.	4.034
NODUTY	1	-1.0344	1.0971	0.8889	0.3458	-0.032752	0.355
NHSG	1	0.8057	0.8255	0.9527	0.3290	0.026402	2.238
COLL	1	-0.3884	0.2302	2.8469	0.0915	-0.063146	0.678
GTGCTTOT	1	-0.00421	0.00435	0.9369	0.3331	-0.033854	0.996
P1	1	0.00117	0.1025	0.0001	0.9909	0.000335	1.001
F_RCTRDI	1	0.3431	0.1949	3.0981	0.0784	0.083140	1.409
PFTSCORE	1	-0.00247	0.00084	8.6837	0.0032	-0.088608	0.998
N_ADDMOS	1	0.3775	0.1447	6.8011	0.0091	0.103909	1.459
DEPLTIME	1	0.00373	0.0183	0.0415	0.8386	0.006460	1.004
DCT8_YRS	1	0.0270	0.0314	0.7392	0.3899	0.024550	1.027
SECUR_DU	1	0.4563	0.2789	2.6771	0.1018	0.052878	1.578
NFMF_DU	1	-0.1064	0.1688	0.3970	0.5287	-0.022288	0.899
RCTG_DU	1	0.1956	0.3080	0.4032	0.5254	0.024549	1.216
INDEP_DU	1	0.4974	0.1494	11.0875	0.0009	0.087905	1.644
SCH_DU	1	-0.6451	0.2900	4.9463	0.0261	-0.086929	0.525
DAUS_DR1	1	-0.0231	0.0123	3.5191	0.0607	-0.057660	0.977
N_INMOS	1	-0.1678	0.1486	1.2752	0.2588	-0.038599	0.845
GEOBACH	1	-0.0166	0.1257	0.0174	0.8950	-0.004050	0.984
BLCK	1	-0.3999	0.1438	7.7375	0.0054	-0.099131	0.670
OTHR	1	0.1514	0.2100	0.5200	0.4709	0.020750	1.163
NBORNCIT	1	0.0403	0.1905	0.0447	0.8326	0.006350	1.041
DIVORC	1	0.2662	0.1979	1.8105	0.1785	0.041666	1.305
SINGL	1	-0.1079	0.2398	0.2024	0.6528	-0.014337	0.898
NUMDEP	1	0.0313	0.0442	0.5014	0.4789	0.025132	1.032
AGE	1	-0.0705	0.0242	8.4420	0.0037	-0.143728	0.932
FEMALE	1	0.4723	0.2497	3.5777	0.0586	0.052827	1.604
TIG	1	-0.0115	0.0306	0.1421	0.7062	-0.015316	0.989
ADSPOUS	1	0.2866	0.2221	1.6653	0.1969	0.037118	1.332
ADD_PAY	1	-0.00942	0.0314	0.0898	0.7645	-0.012849	0.991
NREBONUS	1	0.0431	0.1208	0.1275	0.7210	0.010359	1.044
ADMINSUP	1	0.0552	0.1836	0.0902	0.7639	0.013259	1.057
CSS_T	1	0.8800	0.1690	27.1272	0.0001	0.177666	2.411
CSS_NT	1	-0.2685	0.2109	1.6209	0.2030	-0.048243	0.765
GARSUP	1	0.4617	0.2528	3.3358	0.0678	0.060015	1.587
ELECAVN	1	0.8806	0.1943	20.5339	0.0001	0.157668	2.412
E5	1	2.8448	0.6347	20.0926	0.0001	0.710692	17.198
E7	1	-0.2559	0.3002	0.7266	0.3940	-0.067338	0.774
TT_EASSQ	1	-0.0004	0.000065	39.1422	0.0001	-0.277382	1.000
BIAS	1	-0.7134	0.1922	13.7764	0.0002	-0.523572	0.490

Association of Predicted Probabilities and Observed Responses

Concordant = 79.6%	Somers' D = 0.596
Discordant = 20.0%	Gamma = 0.598
Tied = 0.4%	Tau-a = 0.128
(1930240 pairs)	c = 0.798

The LOGISTIC Procedure

Classification Table

	Correct		Incorrect		Percentages				
Prob Level	Event	Non-Event	Event	Non-Event	Correct	Sensitivity	Specificity	False POS	False NEG
0.000	520	0	3712	0	12.3	100.0	0.0	87.7	.
0.020	498	600	3112	22	25.9	95.8	16.2	86.2	3.5
0.040	474	1390	2322	46	44.0	91.2	37.4	83.0	3.2
0.060	451	1876	1836	69	55.0	86.7	50.5	80.3	3.5
0.080	427	2168	1544	93	61.3	82.1	58.4	78.3	4.1
0.100	410	2378	1334	110	65.9	78.8	64.1	76.5	4.4
0.120	395	2565	1147	125	69.9	76.0	69.1	74.4	4.6
0.140	363	2729	983	157	73.1	69.8	73.5	73.0	5.4
0.160	338	2861	851	182	75.6	65.0	77.1	71.6	6.0
0.180	306	2989	723	214	77.9	58.8	80.5	70.3	6.7
0.200	283	3099	613	237	79.9	54.4	83.5	68.4	7.1
0.220	257	3191	521	263	81.5	49.4	86.0	67.0	7.6
0.240	243	3262	450	277	82.8	46.7	87.9	64.9	7.8
0.260	230	3342	370	290	84.4	44.2	90.0	61.7	8.0
0.280	209	3392	320	311	85.1	40.2	91.4	60.5	8.4
0.300	187	3446	266	333	85.8	36.0	92.8	58.7	8.8
0.320	169	3493	219	351	86.5	32.5	94.1	56.4	9.1
0.340	147	3531	181	373	86.9	28.3	95.1	55.2	9.6
0.360	134	3567	145	386	87.5	25.8	96.1	52.0	9.8
0.380	119	3597	115	401	87.8	22.9	96.9	49.1	10.0
0.400	104	3614	98	416	87.9	20.0	97.4	48.5	10.3
0.420	90	3633	79	430	88.0	17.3	97.9	46.7	10.6
0.440	76	3645	67	444	87.9	14.6	98.2	46.9	10.9
0.460	69	3657	55	451	88.0	13.3	98.5	44.4	11.0
0.480	59	3666	46	461	88.0	11.3	98.8	43.8	11.2
0.500	53	3676	36	467	88.1	10.2	99.0	40.4	11.3
0.520	43	3683	29	477	88.0	8.3	99.2	40.3	11.5
0.540	37	3688	24	483	88.0	7.1	99.4	39.3	11.6
0.560	32	3691	21	488	88.0	6.2	99.4	39.6	11.7
0.580	28	3693	19	492	87.9	5.4	99.5	40.4	11.8
0.600	24	3696	16	496	87.9	4.6	99.6	40.0	11.8
0.620	21	3702	10	499	88.0	4.0	99.7	32.3	11.9
0.640	16	3704	8	504	87.9	3.1	99.8	33.3	12.0
0.660	12	3708	4	508	87.9	2.3	99.9	25.0	12.0
0.680	10	3709	3	510	87.9	1.9	99.9	23.1	12.1
0.700	8	3709	3	512	87.8	1.5	99.9	27.3	12.1
0.720	5	3709	3	515	87.8	1.0	99.9	37.5	12.2
0.740	3	3710	2	517	87.7	0.6	99.9	40.0	12.2
0.760	2	3710	2	518	87.7	0.4	99.9	50.0	12.3
0.780	1	3712	0	519	87.7	0.2	100.0	0.0	12.3

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